AGILITY AT COMPANY X

A diagnosis of operational leadership behavior and team design within the IT-Scrum teams of Company X

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Hereby I present the final result of my master thesis in the field of Organizational Design and Development. After more than seven years at the Radboud University, I have completed a Bachelor's and Master's degree in Law, a Business Administration pre-master, and with this thesis I reached the breech of my OD&D Master program and career as a student.

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I hope you enjoy reading my thesis.

Management summary

Problem

One and a half years ago, the Company X introduced Scrum to their IT department consisting of 150 employees. Currently they have their own scaled agile framework. The Scrum teams work on innovative software features, creating and optimizing them in two-week sprints. While the teams made great progress applying the rituals and rules related to Scrum, great strides can still be made regarding the soft skills of the employees and leaders working together in the Scrum teams. The question from Company X in short is how to influence their employees' behavior in a way that not only the rituals, but also the agile philosophy will be reflected in their behavior. This includes taking on whole-team responsibility and accountability, addressing each other when unwanted behavior occurs, sharing knowledge within and between teams continuously, and focusing on the creation of business value by realizing products more result oriented.

Research design

In order to provide Company X with practical recommendations, the researcher decided to focus her research on diagnosing operational leadership behavior of agile leaders who are in direct contact with the IT teams regarding their day-to-day activities. The researcher also decided to focus on the design of the teams and their tasks. The main part of the research is conducted by interviewing the Scrum Masters, Product Owners and team members from two teams, in order to obtain an image of the situation that is substantiated from multiple perspectives.

Conclusion

During the interviews, it became clear that both teams and their tasks did not meet the ideal structural conditions for an agile team. Because of their multiple-item portfolio, individuals mostly work parallel on independent tasks. Furthermore, the teams work on both user stories (innovations) and incidents (support tasks) during the same sprint. Finally, inherent to the nature of their tasks, the teams deal with a large number of external dependencies.

The Company X IT teams work according to the Scrum method: they are guided by a Scrum Master and Product Owner and they work with two-week long sprints. As a consequence, behavior in line with this method is expected from the team members: bearing whole-team responsibility and accountability, and sharing knowledge continuously. However, in light of the facts stated above, it is not self-evident for the teams to fully benefit from working with an agile method, and thus to display the desired behavior.

Therefore, as a final conclusion for (agile) leaders it is most important to always adjust one's leadership style and practices to the specifics of an individual team and its context. Holding on to agile leadership practices when the design conditions and context are not optimal for working with an agile method, will not make team members display behavior that is desired in an agile context.

Recommendations

Recommendations for Scrum Masters and Product Owners

The first recommendation is directed at Scrum Masters and Product Owners within the Operations train. The results show that the design of the Scrum teams in the Operations train does not fit an agile way of working very well (see paragraph 4.1). Therefore, agile leadership as described in paragraph 2.5 should not unquestionably be applied to any team from this train, but should be consciously considered. The differences between the results on Team A and Team B illustrate the varying situations wherein these leadership practices directed at for example self-organization, Scrum meetings and teamwork are, and are not effective (see Table 4.2, D1, D3, and D6).

Scrum Masters and Product Owners should therefore investigate if the purpose of Scrum and agile practices are achieved. If this is not the case, the practices should be reconsidered (see paragraph 4.3.3). When team members have varying opinions on the effectiveness of Scrum practices, this is a good moment to start a whole-team conversation. What do these practices mean for the team? How can they be altered in order to gain the most out of it?

Furthermore, agile leaders should, in association with the team members, find out what they can reciprocally do for each other in order to achieve a more effective way of working. Find out how team members can challenge and support each other content-wise and process-wise to spark a willingness to continuously enhance their way of working (see paragraph 4.3.6).

Recommendations for Company X

There should be more guidance for Scrum Masters and Product Owners on how to carry out their tasks. This guidance however should be adjusted to the role of Scrum Masters and Product Owners within the agile framework. This means taking into account the specific team and task design of the Scrum teams, which has a substantial influence on the effectiveness of agile (leadership) practices (see Table 4.3, IEF and the items referred to). Now, every agile leader within the Operations train can carry out their tasks as they please (paragraph 4.2). For an inexperienced Scrum Master or Product Owner this may entail implementing agile and Scrum practices by the book. However, as the results indicate, these practices do not fit the Scrum

teams of Company X in all cases (see Table 4.1, B1, B3, B6 and B8). Scrum Masters and Product Owners need to know how to deal with external dependencies (paragraph 4.3.7), how to carry out effective Scrum meetings when tasks miss interdependency (paragraph 4.3.3; Table 4.3, F3), and how to coach a team in self-organization with a multi-item portfolio (paragraph 4.3.1; Table 4.3, F1). Thus, the guidance of agile leaders must be specifically altered to match the context of the Operations train.

With regard to team development, models from Tuckman (1977) and Lencioni (2002) are used to teach Scrum Masters and RTE's how to develop the teams (Doc3A-Doc3D). However, it is unknown if the IT teams can be equalized with the teams from these researches. This must first be investigated before these models are used for team development of the IT teams (paragraph 4.3.8).

Furthermore, there are some dysfunctional organizational practices that disturb the Scrum teams during their sprints. These are practices agile leaders cannot interfere with, thus Company X should do something about them (see paragraph 4.3.7). First, everyone working within the agile framework should respect the rhythm of Scrum, and thus should not hand out extra work, discarding the backlog and the Product Owner. This is confusing for the teams and it slows them down. New tasks can be put on the backlog for the next sprint. Second, the Operation is not aligned with the IT department. The Operation should give higher priority to collaboration with the teams, so that the teams can maintain their velocity. Third, it would be a great enhancement if the contracts with external suppliers could be altered to match the pace of the sprints.

Recommendations for follow-up research

Finally it is recommended to consider follow-up research within the organization on two topics: 1) the task and work division among and within the teams, and 2) the way performance management is established for the employees in the agile teams.

Division of labor

The results in paragraph 4.1 and paragraph 4.3.4 show that teams work both on user stories (innovation tasks) and incidents (support tasks). Ideally however, an agile team is a small group of people who work together on an innovation project with mutual dependent tasks (see paragraph 2.1.3). Therefore it is advised to use an employability matrix to map *all tasks*, both *support* and *innovation* tasks, on a team level for both trains. This will provide insight in the extent to which the tasks of a certain type are scattered among the teams. This is important to know, because support and innovation tasks each require different team dynamics. Support tasks need to be solved ad hoc, while innovation tasks can for example be carried out in sprints.

When all tasks are mapped, the question is: why are both innovation and support tasks assigned to the teams, when they are supposed to be agile, thus working on innovation tasks only? Labor should therefore be divided in another way. An option could be to divide the IT department into an IT Support organization and an IT Development organization. To avoid monotonous work, a person could first be part of a team that develops and implements a new application (innovation project), and when that is completed be subsequently responsible for the maintenance and malfunctions of that application until a certain degree of reliability is achieved (support tasks). After that, this person can be included in a team working on a new innovation.

Performance indicators

Although the behavior of people may be influenced by the way their performance is reviewed, the topic of performance management and performance indicators was not mentioned in this thesis. This choice was made by the researcher because of the fact performance management was not part of the studied literature on agile leadership from which the theoretical framework was constructed. Subsequently, the use of performance indicators by agile leaders was not systematically addressed during the interviews. However, it was discussed during two introductory conversations and two interviews. These remarks, displayed in Annex C, show that tension exists between the coaching role of the Scrum Master and the idea that the Scrum Master can provide a valuable contribution concerning the performance review of individual team members. Right now, performance reviews for all internal employees in the IT teams are performed by someone within the agile framework, who is not in direct contact with the team members on a frequent basis.

A person's behavior can be influenced by the way he is reviewed and by what is expected from him. Therefore it should be examined if performance reviews are based on parameters that reinforce agile behavior. If value creation, knowledge sharing and teamwork are key behaviors that are desired from team members, Company X has to make sure these are reflected in the performance management system. Moreover, the opinions on the content of performance reviews appear to be divided. Therefore it is recommended to investigate if contributions from the Scrum Master, Product Owner and fellow team members in the performance management cycle are desired with regard to the context the teams work in.

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1. Introduction

In this first chapter the topic is introduced, followed by an explanation of the research perspective in the second paragraph. The topic is theoretically framed in the third paragraph. Paragraph 1.4 provides the research object and research question. This chapter is concluded by an outline of the rest of this thesis in paragraph 1.5.

1.1 Introduction of the topic

In this fast-moving world organizations must operate nowadays, it is essential to keep up with their ever-changing surroundings. For this reason, many organizations desire to be *agile:* to be flexible and fast in order to respond to change (Larman, 2003; Hunt, 2005). It should come as no surprise that over the past couple of years, adopting agile practices have become increasingly popular (Cohn & Ford, 2003).

How does an organization become agile? Shore & Warden (2008) stress that there is no such thing as *the* agile method. Agile development is instead considered a philosophy of which the origins can be found in the Agile Manifesto. The Manifesto was developed by seventeen software practitioners that discovered better ways of developing software. Its core values are: *individuals and interactions* over processes and tools, *working software* over comprehensive documentation, *customer collaboration* over contract negotiation, and *responding to change* over following a plan (Agile Alliance, 2001). Agile methods are iterative, incremental, self-organizing and emergent. This implies that a product is not delivered at once and is developed in multiple short cycles, wherein the user of the product is actively involved. Products are developed by self-organizing teams that determine the way they want to work while they are working (Boehm & Turner, 2005).

As agile practices are pervasive and dramatically different from traditional plan-driven methods of product development (Cohn, 2010), such changes will impact important aspects of the organization including culture, structure and management practices (Cohn, 2010; Nerur et al., 2005). One can imagine that organizations coming from a plan-driven development approach (i.e. waterfall), that is characterized by predetermined planning and thoroughly documenting every step, encounter a great deal of challenges during the adoption of agile practices (Gren et al., 2014).

When an organization shifts to working in an agile manner, a lot is asked from its employees. Empowering individuals, self-organization, and whole-team responsibilities are just a few topics

that are hard to achieve in any traditional organization (Appelo, 2011). Members of newly composed agile teams need to be taught the ropes of agile practices, values, principles and meetings. Furthermore, they need to learn to self-organize: to manage, monitor and execute their work. Teams have to change their mindset in order to continuously deliver value in short iterations, and therefore they need to see that teamwork and knowledge sharing are indispensible (Adkins, 2010). Leaders that are knowledgeable in agile and have an adaptive management style are proven to be critical attributes of team capability, which in turn is an important success factor of agile teams (Chow & Cao, 2008). Agile teams that are at the start of their journey towards an agile way of working therefore need a servant leader who guides the team towards becoming a high performance agile team by coaching, teaching, and facilitating (Adkins, 2010; Appelo, 2011).

1.2 Research perspective

One and a half years ago, Company X introduced Scrum to their IT department consisting of 150 employees. Currently they have their own scaled agile framework. The Scrum teams work on innovative and optimizing software features in two-week sprints. While the teams made great progress applying the rituals and rules related to Scrum over the last six months, great strides can still be made regarding the soft skills of the employees and leaders working together in the Scrum teams. The adoption of a certain method does not mean a cultural or behavioral shift is made, thus merely replacing tools and technology will not be sufficient for implementing Scrum in an organization (Nerur et al., 2005).

During exploratory conversations a few issues came to light. The most important one is the absence of desired 'agile' behavior from the members of the Scrum teams. This includes taking on responsibilities and feeling accountable for them as a team, addressing each other when unwanted behavior occurs, sharing knowledge within and between teams continuously, and focusing on the creation of business value by realizing products more result oriented. Furthermore, when the pressure rises, Scrum teams tend to slip back into their old habits: working according to the waterfall method. These problems can have multiple causes and they can be researched from different perspectives.

Three research perspectives have been weighed. The first option considered was the structural perspective. In short, organizational structure is about the distribution of work, the coordination thereof and the question who gets to co-decide on which issues in the organization. The success of self-organizing teams strongly depends on the relations and dependencies within and between teams and other parts of the organization. Furthermore, the composition of the teams, the nature of their tasks, and their capacity to regulate are also of great importance in this

matter (Kuipers et al., 2010). The second perspective considered is the human resources management perspective. The difficulties Company X encounters could arise from the fact that human resources related systems may not be aligned with the agile framework. When teams need to work in an agile manner, but the performance management tools and methods are still grafted on individual competences and targets, friction and problems can arise.

From the exploratory conversations it became clear that until now, Company X mainly focused on changing the structure and processes of the IT department, and less emphasis was placed on changing individual and team behavior. Yet different behavior and attitudes from team members are necessary to ensure Scrum and the agile framework fully succeed. A year and a half into the process, Company X's management sees that the Scrum procedures are followed, but the old culture is still in place. The question from Company X in short is how to influence their employees' behavior in a way that not only the rituals, but also the agile philosophy will be reflected in their behavior. In light of this question, the researcher decided to focus on the behavior of the teams and their direct leaders. Before the implementation of the agile framework, Project Managers were used to being in charge, carrying out directive leadership and bear full responsibility for the outcomes of their team's work. Their work as Scrum Masters has shifted to guiding the team process-wise and removing impediments in order to keep the team running at a steady pace. Because the teams have to work in a new and different agile manner, the behavior of their leaders coaching, guiding and teaching them is assumed to be of great importance.

To study leadership and team behavior, a group dynamics perspective was chosen in consultation with Company X. Group dynamics is a research field that focuses on the nature of groups, the development of groups and the interactions and processes that exist between group members (Cartwright & Zander, 1960). Moreover, group dynamics theories on roles and leadership can be applied to Scrum (Vandepoel, 2016). The researcher chose to examine the Scrum teams through a group dynamics lens in order to gain a broad understanding of how attitudes and behavior come about through interactions between the team members and their leaders.

During the exploratory conversations the researcher asked about probable causes of the perceived problems. The employees the researcher spoke to were not convinced the structure of the teams was one of those causes, hence the choice for a focus on leadership behavior. However, when an organization adopts a method like Scrum, it is essential that the design of the teams and their tasks fit the agile way of working. Because this may be a component that was overlooked or not emphasized enough by Company X during the implementation of the agile

framework, the researcher decided to not discard a structural perspective completely. Working according to a certain method assumes a corresponding group and task design to be in place. For the leaders of the IT teams it is of great importance to know and understand whether or not this is the case, because the effect of agile leadership behavior will in all probability be different in both situations. Therefore the researcher chose to incorporate the structural perspective, and keep it in mind during the research process to be able to determine if the group and task design, the type of tasks, and the division of labor corresponds with an agile way of working using the Scrum method.

1.3 Theoretical framing of the problem & theoretical contribution

Agile teams are self-organizing teams (Agile Alliance, 2001). Self-organizing teams have the authority to monitor, manage and execute their work (Wageman, 2001). However, this does not implicate that there is no role for a team leader. In his model of self-managing teams, Hackman (1986) presents leadership as one of the five support factors that are necessary for the successful use and development of a team. Leadership is necessary to orient a team towards its goal and to help manage its internal and external relations (Manz & Sims, 1987). Furthermore, the leader's role in a self-organizing team entails meeting the need for support through providing resources, encouragement and training (Manz & Sims, 1987; Wageman, 2001; Yeatts & Hyten, 1998).

To be able to empower teams and successfully implement agile practices, management attitudes need to migrate from traditional to agile ones (Boehm & Turner, 2005), which entails a shift from command-and-control to leadership-and-collaboration management (Nerur et al., 2005). Agile team leaders have to be teachers, by explaining agile principles and practices, and by inspiring the team with their previous agile experiences (Adkins, 2010). Agile leaders are coaches in self-organization by empowering the team to fulfill their tasks as they please, and gradually providing them with more process-related responsibilities (Tabaka, 2006). Furthermore, they facilitate meetings to keep the team on track, focused, and to evaluate the team's efforts and process. Agile leaders encourage team members to closely work together and share their knowledge to ensure continuous improvement (Adkins, 2010). They protect the team from dysfunctional organizational practices to secure their velocity and predictability (Abrahamsson, 2003). And finally, agile leaders motivate the team to bring out the best in every individual (Appelo, 2011).

This thesis contributes to the theory on the behavior of teams and their leaders in a specific organizational and structural context, while working according to agile practices. It provides more insight in the reasons why particular leadership behavior occurs and how this is perceived

by teams. Moreover, this thesis provides insight in the importance of team and task design when an agile method is adopted.

1.4 Research objective and research question

For this research, a focus on the behavior of leaders of the IT department is chosen, because the IT department is the first department to adopt an agile method. The research objective of this thesis is to provide Company X with advice regarding the further implementation of the agile framework by gaining insight in the leadership behavior of team leaders and its effect on team member attitudes, as well as the compatibility of the team and task design with the agile way of working. Therefore the following research question will be addressed:

To what extent does current operational leadership behavior in the teams of Company X's IT department, studied from a group dynamics perspective, match the demands for leadership in an agile way of working, and to what extent is the team and task design of the IT teams compatible with an agile way of working?

This thesis is focused on diagnosing leadership behavior of leaders who are in direct contact with the IT teams regarding their day-to-day activities. In order to answer the research question, the researcher will additionally assess if the team and task design fit working following agile values and principles.

The research will be conducted by interviewing both leaders and team members from two teams, in order to obtain an image of the situation that is substantiated from multiple perspectives. If findings of this research show that leadership behavior or team and task design are not in line with agile values and principles, specific recommendations will be made to alter the guidance of the teams.

1.5 Outline of the thesis

Chapter two contains the theoretical framework wherein agile and Scrum are addressed, agile tasks are discussed, and concrete agile leadership practices will be presented and explained. Furthermore, central cause-and-consequences and assumptions are discussed, and the conceptual model is posed. Chapter three covers the methodology of this study and the way research ethics are addressed. The findings of the research and their analysis are presented in chapter four. In the fifth and last chapter of this thesis, the research question is answered, recommendations to Company X will be made, and the contribution to the theory is discussed. Lastly, limitations of the study are addressed, suggestions for further research are made, and a critical reflection on the research is given.

2. Theoretical background

This second chapter contains the theoretical framework wherein agile and Scrum are addressed, agile tasks are discussed, and concrete agile leadership practices will be presented and explained. Furthermore, central cause-and-consequences and assumptions are discussed, together with the presentation of the conceptual model.

2.1 Agile and Scrum

Agile has two connotations. The first is the idea that worlds of technology and business have become high speed, turbulent and uncertain, requiring a process that both creates change and responds to change rapidly. This implies the second, namely the requirement of responsive people and organizations. Agile development focuses on the skills and talents of people and shapes the process to specific individuals and teams, instead of the other way around (Cockburn & Highsmith, 2001).

2.1.1 Origins of agile

The term '*agile'* was devised by a group of people experienced in developing software in an agile way: the Agile Alliance (Cockburn & Highsmith, 2001). The agile movement started as a response to traditional sequential development methods such as waterfall. The waterfall model assumes that – after an extensive planning phase – a project team has all the necessary information about the requirements, solutions and goals of a project (Lei et al., 2017). This linear method of development only is fruitful when the environment is stable, the final product is clear and the road leading there can be predetermined (Vandepoel, 2016). But since the mid-1990's both the business and technology environment kept shifting and the requirements got out of date quickly. When the call for a more iterative method of development became louder, practitioners developed practices to embrace high rates of change, rather than to reject them (Williams & Cockburn, 2003).

In 2001, the Agile Alliance created the Agile Manifesto, wherein four core values and twelve principles of agile development were stated. Since that moment, the newly developed methods and practices belonged to the framework called 'agile' (Williams & Cockburn, 2003). With an agile method, a product is developed in multiple cycles while a close collaborating team continually gains feedback on provisional versions of the product (Vandepoel, 2016). The core values of agile are *individuals and interactions* over processes and tools; *working software* over comprehensive documentation; *customer collaboration* over contract negotiation; and *responding to change* over following a plan (Agile Alliance, 2001).

When executed well, agile increases employee satisfaction and team productivity. It minimizes the waste inherent in repetitive planning, superfluous meetings, excessive documentation, low-value product features and quality defects. By improving visibility and continuously adapting to changing priorities of customers, agile enhances customer satisfaction and engagement, reduces risk and brings valuable products and features to market more predictably and faster. It builds mutual respect and trust by engaging team members from multiple disciplines as collaborative peers. Finally, by dramatically reducing the time wasted on micromanaging projects, agile allows managers to devote themselves more to higher-value work: prioritizing strategic initiatives, creating and adjusting the organizational vision, focusing and simplifying work, assigning the right people to tasks, expanding cross-functional collaboration, and removing impediments to progress (Rigby et al., 2016).

2.1.2 Basics of Scrum

The fundamentals of the agile development method *Scrum* are relatively simple. The organization forms and empowers a small, cross-functional team that works on innovation opportunities. The team includes all the skills necessary to complete its tasks; it organizes itself and is strictly accountable for every aspect of their work (Rigby et al., 2016). The team delivers the product incrementally through a series of short development phases called 'sprints'. The product backlog, which is a list of all product requirements, drives team activity (Rising & Janoff, 2000). The Product Owner is responsible for prioritizing the backlog. The team can take on as much of the product backlog as they think they can turn into an increment of product functionality within a sprint. Further, the team itself decides how to work, and they must not be disturbed or given direction by anyone outside of it during a sprint. Scrum therefore relies on team initiative and integrity (Beedle & Schwaber, 2002).

Every day, the team comes together for a short 15-minute status meeting: the daily stand-up. The purpose of the stand-up is to facilitate coordination between team members, to focus on getting things done, to bring impediments to light, and for each member to make a daily commitment to the team (Adkins, 2010). Other Scrum events are the sprint planning, the sprint review (or inspect & adapt) and the retrospective. The Scrum Master facilitates all Scrum events and is also responsible for ensuring Scrum values, practices and rules are enacted and enforced. The Scrum Master keeps the team working at the highest possible level of productivity by helping the team make decisions, remove impediments and acquire resources as needed (Beedle & Schwaber, 2002).

2.1.3 Tasks of an agile team

Agile methodologies are devised for software development; cross-functional teams consisting of architects, developers and testers have the responsibility for the development of a software

feature from the moment a requirement from the customer reaches the team, until it is translated into software functionality that meets the customer's needs (Mellor et al., 2002). Therefore working in an agile way, for example using the method Scrum, is most effective and appropriate under conditions that are common in software innovation projects: the problem is complex, solutions are initially unclear, and the requirements of the product or service will most likely change during the process. Furthermore, it is possible to modularize the work and collaborate closely with the customer. Finally, for this type of innovations, cross-functional collaboration is vital and creative breakthroughs are of great importance. These conditions are typically present in projects and activities in the field of product development, strategic planning, marketing, supply-chain, and resource allocation. They are less common in operations that are characterized by routines. Innovation projects that are less appropriate for agile methods typically involve work that is similar to what has been done before, has more clear solutions upfront, can be planned in detail, and involves problems that can be solved sequentially in functional silos (Rigby et al., 2016).

The benefits of working agile are best achieved when a cross-functional team works closely together on a complex problem in short iterative cycles, which provides the possibility to incrementally deliver the product while responding to change (Boehm & Turner, 2005). A team should represent all disciplines and skills necessary to go from an idea to an implemented feature (Cohn, 2010). The effectiveness of people working together is one of agile's core concepts, so intense interaction and team proximity are vital for the team to come up with the best solutions (Highsmith & Cockburn, 2001). Also, the teams should be enabled to work without interruption during iterations (Denning, 2015).

As agile development focuses on the skills and talents of people, the process must be shaped to specific individuals and teams (Cockburn & Highsmith, 2001). Taking the above into account, certain design conditions seem to be important for an agile team. Kuipers et al. (2010) provide eleven conditions that influence the functioning of groups. For an agile team a few of these seem especially important, as they need to be optimal with regard to constructive communication and teamwork. Ideally, an agile team works on one project at a time (Cohn, 2010), and the team members' tasks should be complementary interdependent (Hackman, 1978; Kuiper et al., 2010). Moreover, the team should have a communal interest in a process that is free of disturbances. Therefore, the team should have access to the space, information, and feedback it requires; and it should be qualified to regulate their own affairs and solve their own problems (Kuiper et al., 2010).

2.2 Group dynamics perspective

For this thesis, a group dynamics perspective has been chosen. Group dynamics is a research field that focuses on the nature of groups, the development of groups and the interactions and processes that exist between group members. Thus, in group dynamics the behavior of people in small groups is the point of focus (Cartwright & Zander, 1960). This perspective is chosen, because group dynamics theories on leadership and roles have proven to be relevant in analyzing a Scrum team (Vandepoel, 2016).

In group dynamics, leadership is described as carrying out all possible behavioral forms that help a group in achieving the desired results, and that contribute to the viability of that group, like fostering and satisfying interpersonal relations. To that effect, leadership can be fulfilled by one or more group members. Moreover, situational aspects determine what kind of behavioral form is necessary in a specific situation and which group member will fulfill it. These situational aspects include the group structure, the nature of the group's goals, the needs and attitudes of group members and the expectations from the external environment of the group (Remmerswaal, 1995).

This group dynamics view on leadership is reflected in the Scrum method, as leadership can be fulfilled by multiple members from the Scrum team depending on situational aspects. 'Scrum Master', 'Product Owner' and the 'Development Team' are generally qualified as 'Scrum roles' (Beedle & Schwaber, 2002). In group dynamics, a role in a group refers to the expectations group members have with regard to the behavior and attitude of the person that holds a certain position. Roles can be informal as they arise spontaneous, and they can be formal when they are assigned to a certain position in the organization and group (Hare, 1976).

Both roles and leadership behavioral forms can be divided into two main categories, focused on the group task, and focused on group maintenance (or group process) (Remmerswaal, 1995). In Scrum, a clear distinction is present between the task and process roles, as well as the task and process oriented leadership forms: the Product Owner fulfills a steering task role, and the Scrum Master fulfills a steering process role (Vandepoel, 2016). However, the Scrum Master and Product Owner are not the hierarchical leaders of the team, and members of the Development Team are expected to exhibit leadership behavior in their role as well (see paragraph 2.4.2). This combination provides an interesting point of departure for a research directed at leadership behavior within a Scrum team.

2.3 Agile roles and leaders

Within a Scrum team, three roles can be distinguished. These are the Scrum Master, the Product Owner and (members of) the Development Team. Everyone on the Scrum team can display

leadership behavior. For the roles of Scrum Master and Product Owner this behavior usually includes role related tasks, which are illustrated below.[1]

Scrum Master

According to the *Scrum Guide,* the Scrum Master is the servant leader of the Scrum team. The Scrum Master coaches the team in cross-functionality and self-organization, helps the team create high-value products, removes impediments to the team's progress, facilitates Scrum events and coaches the team in organizational environments in which Scrum is not yet fully understood and adopted (Scrum Guide, 2016). The Scrum Master helps the team to make decisions and acquire the needed resources. Furthermore, the Scrum Master is the driving force behind Scrum practices and ensures the enactment of Scrum practices, values and rules (Bass, 2014; Beedle & Schwaber, 2002).

Product Owner

The Product Owner liaises with stakeholders to identify and select the most important requirements for inclusion in each sprint (Bass, 2014). The role entails strategic decision making and constantly setting direction, because every decision must be made considering what option yields the most business value at that given time. Furthermore, a Product Owner should be fully present with the team and engage with them to ensure they keep moving forward. The Product Owner protects the team from external pressure in order to keep the team focused. Finally, a Product Owner keeps the bigger picture of the product in sight of the team, so that the team can work directed to its goal every sprint (Adkins, 2010).

Development Team

Members of the Development Team are leaders through self or shared leadership (see paragraph 2.4.2). Appelo (2011) believes a cross-functional team may function better with multiple leaders, each leading in their own area of interest, for example on a functional, process or architectural level.

2.4 Forms of agile leadership

Because agile methods focus on people and collaboration combined with the need to embrace change, leadership requirements are vastly different than those using traditional process oriented approaches to development. In this environment, the way of interacting with others and a leader's personality profile are at least as important as their intellectual ability and 'hard' project management skills (Bonner, 2010). Agile leaders can be qualified as facilitators and coaches (Adkins, 2010). However above all, they are expected to be a servant leader (Adkins,

[1] This is however not a prerequisite. The role of Scrum Master can for example rotate among members of the Development Team, or a team could work without the Scrum Master role entirely (Diebold et al., 2017).

2010; Prikladnicki et al., 2016; Scrum Guide, 2016; Tabaka, 2006). With regard to the members of agile teams, shared or self leadership will be addressed as well.

2.4.1 Servant leadership

Servant leadership is not motivated by self-interest. Rather, it ascends to a higher plane of motivation that focuses on the needs of others (Greenleaf, 1977). After an extensive review of the literature on servant leadership, Russell and Stone (2002) identified nine functional and eleven accompanying attributes of servant leadership. The functional attributes vision, honesty, integrity, trust, service, modeling, pioneering, appreciation of others and empowerment are the operational qualities and characteristic features belonging to servant leaders. They can be observed through specific leadership behavior. Because this research is focused on operational leadership behavior in an agile context, the attributes with the best fit are illustrated below.

- A servant leader establishes *trust* through direct interaction with the team members. It is a significant factor in influencing leader-member relations, productivity and leadership effectiveness (Fairholm, 1994). On top of that, trust is important in interpersonal communication. For trust to be maintained, leaders must show they are competent in their jobs (De Pree, 1997).
- Superfluously, *service* is the core of servant leadership. A leader that chooses a service role needs to provide the resources others need to achieve success (Fairholm, 1997). This means making information, time, attention, material and other resources available to followers (Fairholm, 1998).
- Besides acting as caretakers, leaders should act as *role models*. They can stimulate others to act in the common interest by visibly setting the right example (Van Dierendonck & Rook, 2010).
- Ulrich (1996) stresses leaders need to be *pioneers* who have strong values and beliefs that shape new approaches to old problems. They have a unique role in social and organizational change (Burns, 1978). Yukl and Tracey (1992) indicated that corresponding influence tactics inspirational appeal, rational persuasion, and consultation are most effective because of their non-manipulative nature.
- Servant leaders visibly *encourage and appreciate* team members by listening to them (Greenleaf, 1977).
- "Servant leaders multiply their leadership by *empowering* others to lead" (Wilkes, 1996, p. 25). The goal of empowerment is to create leaders at all levels of the organization. This can be achieved by a pull rather than a push style of influence in which the leader attracts, energizes and motivates people (Bennis & Nanus, 1997). Leaders that want to empower, must be teachers. An important form of teaching in the context of servant leadership is coaching (Crom, in Russell & Stone, 2002). Empowerment in particular involves the nurturing of participatory leadership

and delegating responsibility (Neuschel, 1998). Furthermore, it involves using participative goal setting and encouraging independent action, teamwork, opportunity thinking, self-development and self-reward (Pearce & Sims, 2002).

2.4.2 Shared leadership

Besides leadership displayed by a designated leader, leadership can also emerge from a context, demonstrated by members of the group. Shared or self-leadership is a group process in which leadership stems from, and is distributed among members. Because of the increasing use of empowered teams and the attendant flattening of organizational structures, more traditional models of leadership are questioned. Shared leadership, that emanates from the members of a team, could be the solution (Pearce & Sims, 2000; 2002). Furthermore, Pearce & Sims (2000) believe shared leadership, or in other words lateral influence among peers, should play a role of importance in explaining team effectiveness and team dynamics.

According to Appelo (2011), shared leadership is desirable in an agile context because cross-functional teams ideally exist of specialized generalists. Through shared leadership, the right people are able to stand up and take on a lead role when the team is working on something in their area of expertise. Appelo (2011) further believes an agile leader can cultivate shared leadership, or 'informal leadership' as he calls it, by supporting emergent leadership positions, but to not proceed to assigning such roles as an agile leader yourself.

2.5 Agile leadership practices

From literature on leadership in an agile context, nine types of specific operational leadership practices are distinguished. In the context of Scrum, these practices are connected to the role of Scrum Master, with the exception of *guiding & setting direction, managing the context,* and *motivating the team*. These three are usually performed by both the Scrum Master and Product Owner. However, through shared leadership, members of the Development Team can also take on a leading role on each of these topics. For this reason, and because most literature addresses agile leadership in general, the term 'agile leader' is often used throughout this paragraph.

2.5.1 Coaching in self-organization

In fostering self-organization, an agile leader should focus on building relationships and defining a mission, rather than prescribing tasks (Highsmith, 2000). To that extent, the leader presents him or herself as a process lead, and not as a team or project manager (Tabaka, 2006). With a starting team however, the agile leader can take on a more present, facilitative role if the team is still figuring out how to self-organize. In this case, the team should be given structured work, and the agile leader should not interfere with their approach. The team must thus get some space and be encouraged to figure out the best way to complete its work. Little by little, the team can take on more process-related responsibilities (Tabaka, 2006). Finally, agile leaders should at

all times be careful not to fall into the 'micromanagement trap'. This occurs when for example a Scrum Master intends to delegate more authority to team members, but feels the need to control and monitor them closely until he or she believes they are ready for it. By doing this, team members are not able to prove they can handle the authority, and therefore often stay dependent on the decision-making of the Scrum Master (Appelo, 2011; Thomas, 2000).

2.5.2 Coaching in agile & Scrum

Conboy et al. (2011) believe that one of the key challenges to agility is the need to understand and learn agile values and principles, instead of just the practices. To achieve this, team members should receive agile training, agile coaching should be encouraged, and cross-team observation and validation of agile practices should be ensured. Guidance by leaders that are knowledgeable in agile is proven to be a critical attribute of team capability, which in turn is an important success factor of agile teams (Chow & Cao, 2008).

Through mentoring, an agile leader shares ideas and examples from past agile experiences, guiding the team to use agile well. Agile rules should be conveyed strongly together with the belief that agile provides a better way to work. This must be backed up with illustrating examples. Both agile practices and principles can be seen as rules; the principles provide the 'why' to each practice. In working with a team that is newly assembled, this means getting all team members on the same page as it comes to agile believes (Adkins, 2010).

2.5.3 Facilitating meetings

Meetings should always belong to the team, meaning the Scrum Master or agile leader should not be the focal point. The daily stand-up is a 15 minute meeting in which every team member answers the following three questions to organize themselves for the day's work ahead:

1. What did I get done since the last stand-up?
2. What will I do before the next stand-up?
3. What are the impediments blocking me or slowing me down?

When the stand-up is done well, the team commits to complete the work of a sprint together, the team excels in coordination to achieve zero wait time, the team focuses on getting tasks done instead of having a lot in progress, the team knows what to expect from each other, and the team raises impediments (Adkins, 2010).

With a new team, the Scrum Master can coach them through the stand-up by teaching them and reinforcing the generic cadence of the stand-up. When the team understands this, the Scrum Master steps back – for preference out of direct eyesight – to let the team run the stand-up themselves. (Adkins, 2010).

Moreover, a facilitative leader helps individuals and groups become more effective by building their capacity to reflect on and improve their way of working (Schwarz, 2002). The purpose of the retrospective is to inspect and adapt: to look back on the way the team worked during the previous sprint. How did the team work together to achieve the sprint goal? The team also agrees upon and commits to a couple of things it will do better during the next sprint (Adkins, 2010). Eventually, coaching during a retrospective should not be focused on creating a list with improvements, but on teaching team members *how* to learn from one another (Hackman, 2002).

2.5.4 Guiding & setting direction

By guiding the team and setting direction, language can be a very powerful tool (Adkins, 2010; Tabaka, 2006). By asking the team questions, a leader assures the team it owns its answers and expertise. Questions can be used to encourage the team to leave old thinking behind, and create a path towards different thinking. For a starting team, questions are a good means to get the team to exchange information and bring other team members into the discussion (Tabaka, 2006). A leader must be aware not to push team members into a specific direction by asking suggestive questions. Therefore, 'powerful questions' are best used in guiding an agile team. Powerful questions are truly open and are not asked with a 'correct' answer in mind (Withworth et al., 2007).

2.5.5 Facilitating whole-team decision-making

Agile teams have the authority to make their own decisions, not dictated by a manager or leader. Therefore the agile leader should have faith in the team's ability to do its work and particularly believe that the team will make better decisions as a whole than the leader alone would be able to. An agile leader should thus accept the loss of control and allow the team to have full responsibility. When a leader steps back during the decision-making process, the team will own its decisions and team commitment will grow. The leader can then specifically step in when a more difficult decision must be made and the team loses focus (Tabaka, 2006).

Furthermore, it is important to strive for whole-team participation and consensus-driven decision-making. This entails that every team member can live with and supports every decision. Consensus means no one has been compromised and none of the team members strongly disagrees with any decision or recommendation (Tabaka, 2006). Conboy et al. (2011) studied 17 organizations and concluded that team decision-making in all cases included a democratic voting system to ensure the opportunity for every team member to provide input.

2.5.6 Facilitating teamwork & encouraging knowledge sharing

The idea of working agile centers around the notion that when people work together in a team, they can achieve much more than they would individually. Cockburn and Highsmith (2001) noticed this time and time again during brainstorming and joint problem solving sessions. Agile

leaders can serve as collaboration conductors by facilitating teamwork and encouraging knowledge sharing. The more knowledge is shared among team members, the more teamwork will occur (Adkins, 2010).

According to Adkins (2010) there are two forms of teamwork: cooperation and collaboration. Cooperation features the smooth flow of work-in-progress from one team member to another and between the team and the wider organization. When cooperating, the team moves itself toward their shared commitment through daily fine-grain coordination of everyone's efforts. People talk with one another defenselessly and build understanding of the whole and of their respective parts as they achieve real results regularly. With collaboration, the whole is greater than the sum of the individual parts. Collaboration needs cooperation as its base, but it adds the essential ingredient for yielding innovative, breakthrough results: emergence. Emergence means that team members build on top of each other's ideas to come up with something wherein the separate personal ideas are no longer distinguishable. Not every team needs to achieve collaboration in order to deliver results. This depends on the nature of the team and its tasks.

Sharing knowledge through face-to-face communication is the most valuable form of communication when it comes to agile methodologies (Agile Alliance, 2001; Tabaka, 2006). It creates a broad and direct access to the multitude of information that steadies and drives a team to successfully deliver products. To become more effective in sharing information, teams should be taught by a leader who leads by example and applies neutrality and questioning in order to share information. Other examples of ways to encourage this are to use brainstorming before having the team reach a decision, and to make information and subsequent decisions visible to all team members (Tabaka, 2006).

2.5.7 Managing the context

As an agile leader, managing the context means creating optimal conditions for the team to succeed. This entails removing impediments, so that the team can keep its velocity and focus (Bass, 2014; Beedle & Schwaber, 2002). Moreover, an agile leader should continuously challenge dysfunctional organizational practices. In order to protect the team, the agile leader should interfere with such practices to shield off the team, again to make sure the team can continue to focus during the sprint and maintain its flow and pace (Abrahamsson, 2003; Appelo, 2011).

2.5.8 Developing the team

An agile leader should support the team during their development towards a mature team (Vandepoel, 2016). Providing people with a shared goal, and addressing interpersonal conflicts are a few examples of practices related to team development.

Besides expressing directives, goals also help to substantively enhance morale among team members. Defining a purpose for a team makes it easier for a leader to unify and motivate people by providing them a shared, realizable dream (Thomas, 2000). A shared goal is not the same as the goal of the customer, project manager, shareholder or manager. A shared objective with an extrinsic purpose transcends any goals of individuals and is intended both as a directive and to improve employee satisfaction (Appelo, 2011).

Conflicts are necessary to build trust. By figuring out an efficient way to resolve conflicts, the team works towards attaining a unified culture and a better way to collaborate (Wheelan, 2013). Agile teams should therefore be able to capture their self-drafted norms in a project charter, so that the team determines how to make decisions, assign work, give and elicit feedback and resolve conflict (Tabaka, 2006).

2.5.9 Motivating the team

Motivation is the activation of goal-oriented behavior. When people feel good about themselves, they will produce good results. For that reason an agile leader should be focused on keeping the team members energized and motivated. Therefore it is important for a leader to know what intrinsically motivates the individual team members (Appelo, 2011).

2.6 Conceptual model

In Scrum, three leadership roles can be distinguished. The Scrum Master fulfills a process role, the Product Owner fulfills a task role, and members of the Development Team can take on a leadership role as it emerges (Vandepoel, 2016). From the review of leadership and agile literature, it follows that agile leaders have an important role with regard to the guidance of an agile team. Agile leaders have to be teachers, explaining agile principles and practices, and inspiring the team with their previous agile experiences. Agile leaders are coaches in self-organization by empowering the team to fulfill their tasks as they please, and gradually providing them with more process-related responsibilities. Furthermore, they facilitate meetings to keep the team on track and focused, and to evaluate the team's efforts and process. Agile leaders encourage teamwork and knowledge sharing to ensure continuous improvement. They protect the team from dysfunctional organizational practices in order to secure velocity and predictability. And finally, agile leaders motivate the team to bring out the best in every individual.

Agile leaders should therefore be servant leaders and provide the team in their needs in order to create the most value according to an agile way of working. Empowering team members, wielding a light touch, and knowing when to step back are of great importance. When an agile leader possesses all these qualities, an agile team will be properly coached and inspired, and

above all will be allowed space to figure out how to self-organize and create value as a team. When the leader of an agile team is too concerned with the content of the work, is closely monitoring the teams every move, and is afraid to lose control, the team will stay dependent on its leader. That is why the following assumption is made: the operational leadership behavior of agile team leaders influences the degree to which Scrum teams and individual members behave in a way that is essential in working agile. This behavior includes embracing whole-team accountability, sharing knowledge within and between teams continuously, and focusing on the creation of business value.

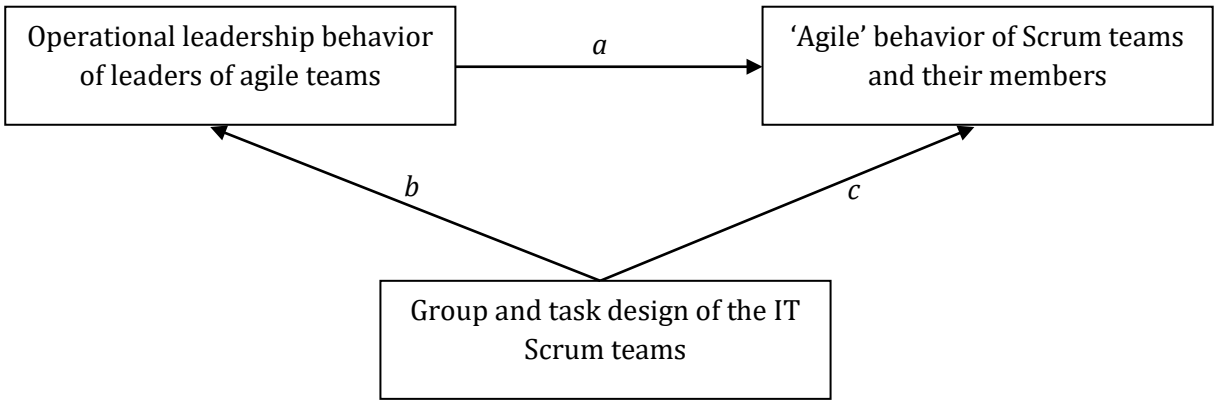

Figure 2.1 – Conceptual model

In Figure 2.1, the stated assumption is shown by the direct relation indicated by *a*. However, the literature used to create the theoretical framework on agile leadership behavior, assumes a team to be truly agile. In terms of group and task design, this means that a cross-functional team works closely together on a self-contained innovation project without being disturbed. The tasks of the individual team members should be complementary interdependent, and the team should be able to regulate their own affairs and solve their own problems. Whether or not these conditions are in place, will have a direct effect on the way leadership behavior is carried out, as well as on the agile behavior displayed by the members of the IT teams. The design of a team includes what is expected from leaders in terms of leadership. Therefore, the behavior of leaders will be influenced by the group and task design of a team. This effect is displayed by *b.* Finally, the design of the team and its tasks also has a direct effect on the behavior of the members of the Scrum teams, which is shown by *c*.

3. Methodology

In this chapter, insight will be provided regarding the methodology of this study. First, the research method and case will be discussed. Next, the methods of data collection will be presented together with the reasons for selecting the methods used. This is followed by the procedure of data analysis. Finally, the quality of research and research ethics will be addressed.

3.1 Research method

The goal of this thesis is to provide Company X with insights regarding the operational leadership behavior of agile leaders, and the design of the IT Scrum teams by means of a diagnosis. The purpose is therefore to describe, interpret and explain phenomena, meanings and behavior. To understand the origin of perceptions, having context is a requisite, and multiple aspects of people need to be studied in-depth (Boeije, 2014). Because of this, and the fact that research is conducted solely at the IT department of Company X, a qualitative research method is the appropriate choice. The purpose of qualitative research is to describe and understand social phenomena through the meaning people give to events and experiences in their daily life (Boeije, 2010). Following the interpretative approach to qualitative research, it is therefore important to study people from a first-person perspective; to try and see the world through their eyes (Tijmstra & Boeije, 2011).

A diagnosis entails a critical assessment of a situation with the use of evaluative knowledge. In practical research, this knowledge is used to compare a current situation with a desired situation. Subsequently, recommendations in terms of possible improvements or problem solutions can be made (Verschuren & Doorewaard, 2015). In this thesis, a diagnostic description of the current situation regarding the group and task design of the teams and, predominantly, regarding agile leadership behavior is presented. In paragraph 5.3 several recommendations are proposed as a result of the analysis of the collected data.

3.1.1 Case study

For this research, the chosen strategy is a case study: a type of research in which the researcher tries to obtain an in-depth and integral view of one or several demarcated objects or processes. A case study can for example be used to understand everyday practices and their meanings to people involved, which would not be revealed in brief contact (Hartley, 2004). A case study is characterized by a small amount of research units, a labor intensive approach, going in-depth, a selective sample, open observations at location and the desire to obtain an integral image of the object as a whole (Verschuren & Doorewaard, 2015).

Complex phenomena are best approached through multiple methods (Hartley, 2004). When studying one single case, it is advised to emphasize method triangulation to rule out coincidence and ensure an in-depth approach. To this extent, interviews and the consulting of relevant company documents are combined in this research. (Verschuren & Doorewaard, 2015). With the interviews, two perspectives are represented: from the Scrum Master and Product Owner in their role as leader, and a bottom-up perspective from the team members. Thus, triangulation is achieved by cross analyzing the data collected from the interviews (two perspectives), the assembled documents.

The researcher has made the choice not to carry out any participant observations. Within the time frame that was reserved for data collection, executing participant observations was not possible because of the planned vacations of multiple people on both teams. When two or three people are absent, the dynamics within a team of eight to ten people will change. Observing an incomplete team does not reflect the daily practice, therefore the researcher made the decision not to perform participant observations.

3.1.2 Case Background

At the end of 2015, Company X started with the implementation of an agile framework in their IT department. This is a scaled agile framework, in which multiple Scrum teams are connected and divided into two Agile Release Trains (ART): the Commercial Differentiations train and the Operations train. Both trains consist of several Scrum teams that work according to the Scrum methodology. The difference between the two trains is their customer. The customer of the Commercial Differentiations train is the customer of Company X. This train for example works on developing a new modules and features for the website. The customer of the Operations train is 'the Operation': the certain groups of employees, and the technical service. Teams in the Operations train mainly deliver new software from suppliers in the form of applications.

In Figure 3.1, the IT department is schematically represented. Both trains consist of approximately six teams with 8-10 people on each team. Every team has a Scrum Master and Product Owner. For each train, Company X appointed a Release Train Engineer that takes on team transcending tasks and oversees dependencies between teams. The teams' work originates from the Portfolio Layer in the form of epics. An 'epic' is an extensive and undefined idea that has to be divided into user stories. Input for epics of the Operations Train originates from the Operation (the customer) and external suppliers. A 'user story' is a concise wish or demand from the customer the teams work on during the two-week sprints. In consultation with the Product Owner, specific user stories are assigned to each team. The Product Owner visibly prioritizes the user stories (or even smaller story points) on the team's backlog. The teams roughly plan their work for a period of ten weeks during a Product Increment planning, wherein also mutual

dependencies are determined. Each team individually plans their work every two weeks at the outset of a new sprint.

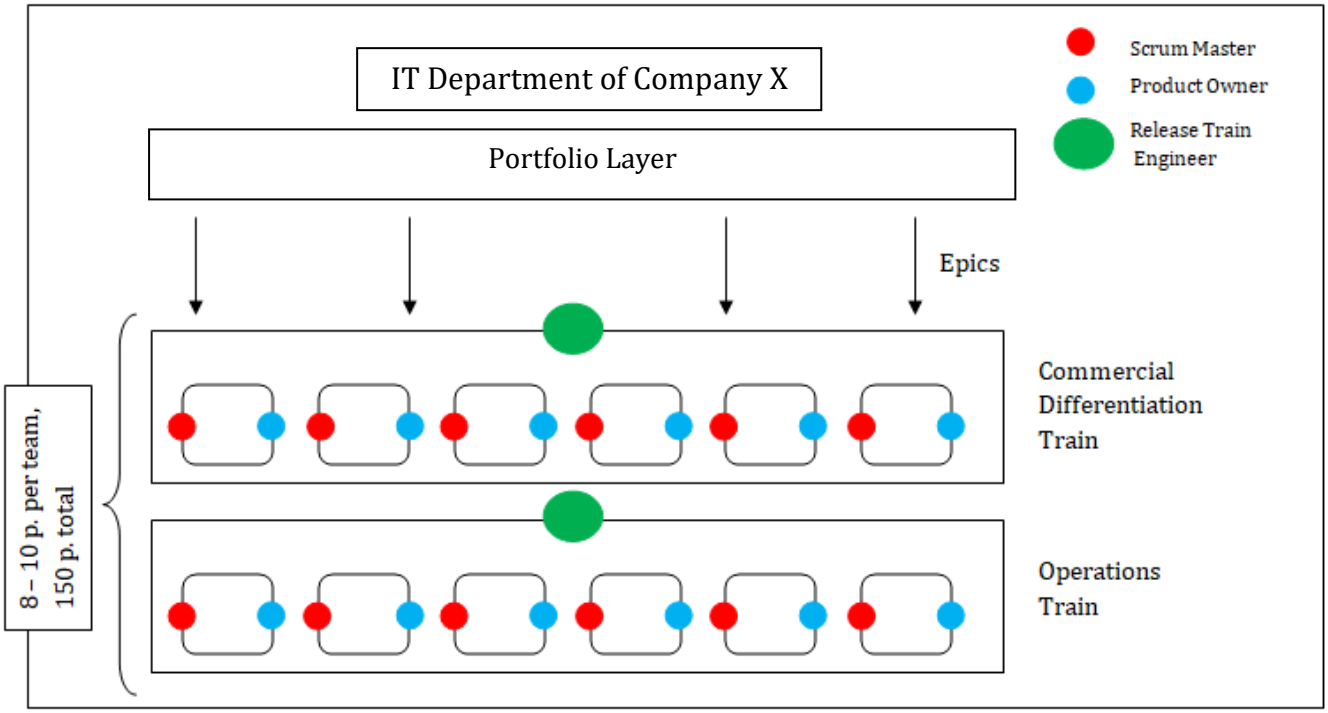

Figure 3.1 – The IT department of Company X

3.2 Data collection

The data collection methods used in this research are semi-structured interviews and document analysis, preceded by a preliminary research. While collecting data, memo's were continuously written to assist the researcher during the data analysis.

3.2.1 Preliminary research

Before deciding on any research perspectives, introductory conversations were held with four employees of Company X that are related to the IT Scrum teams. The conversations were focused on getting an idea of the issues that were present concerning the implementation of the agile framework and the functioning of the teams. A great variety of impressions were obtained and a proper introduction with the organization was made. In addition to these more formally arranged conversations, the researcher spent multiple days at Company X, talking to an Agile Coach and a few Scrum Masters from both the Operations and Commercial train. Furthermore, the researcher attended several Scrum Meetings, among which a stand-up, a sprint planning, a retrospective and a Release Train meeting with all Scrum Masters and Product Owners from the Operations train. During these meetings and conversations, the researcher gained an idea of the

way the teams work and a notion of what the Scrum meetings at Company X entail. Finally, the preliminary research helped to get a hint of the people and culture of Company X.

3.2.2 Document analysis

Several documents were analyzed (Annex D). An advantage of this method of data collection is its durability; documents can be consulted at any time during a research process (Verschuren & Doorewaard, 2015). The documents were provided by the VP IT, one of the Agile Coaches and an employee of the Business Support Center. The documents provided a welcome addition to the other collected data and served as handy tool during the determination of the research subject.

Name of Document	Purpose	Year of Publication	Code
Essentials Agile @ HV	Gain insight in the agile and Scrum practices and values according to Company X and the agile framework.	2016	Doc1
Job description Scrum Master	Gain insight in the fulfillment of the role of Scrum Master as intended by Company X.	2016	Doc2A
Job description Product Owner	Gain insight in the fulfillment of the role of Product Owner as intended by Company X.	2016	Doc2B
Job description Release Train Engineer	Gain insight in the fulfillment of the role of Release Train Engineer as intended by Company X.	2016	Doc2C
Leergang SM en RTE – workshop 1	Gain insight in the (agile) practices Company X deems necessary for their Scrum Masters and Release Train Engineers to carry out. Gain insight in the way these topics are taught and brought to the attention of the Scrum Masters and Release Train Engineers.	2017	Doc3A
Leergang SM en RTE – workshop 2	Idem	2017	Doc3B
Leergang SM en RTE – workshop 3	Idem	2017	Doc3C
Leergang SM en RTE – workshop 4	Idem	2017	Doc3D

Table 3.1 – Overview of analyzed documents

3.2.3 In-depth semi-structured interviews

In-depth interviews are used to get a deep understanding of a certain situation. The semi-structured nature of the interviews allows the researcher to ask spontaneous follow-up questions in order to obtain a more rich understanding of a certain matter. It also provides the

researcher with the opportunity to change the order of, or rephrase questions if circumstances ask for it (Verschuren & Doorewaard, 2007). A qualitative interview is the ideal method to examine topics in which different levels of meaning can be explored. Therefore it can be of great use in studying organizational and group identities in organizations where a complex pattern of professional, interpersonal, work-group and organizational loyalties exists (King, 2004).

At Company X, ten in-depth semi-structured interviews were conducted. The selection of the participants was very important, because in order to draw conclusions on leadership behavior, it was strongly preferred to interview both team members and leaders from within the same team. As stated, the IT department consists of two 'trains' with multiple teams. To be able to compare two teams in terms of leadership behavior and design, the choice was made to select teams that belong to the same train. Those teams have similar tasks, the same customer, and the same Release Train Engineer within the train. In consultation with an Agile Coach, two teams from the Operations Train were chosen. The choice for this train has been made because ninety percent of the people working in the Commercial Differentiation Train are hired from external companies. In the Operations Train, the ratio of internal and external employees is approximately fifty-fifty. Furthermore, Company X has noticed a higher amount of difficulties concerning the agile way of working and mindset within the Operations Train.

The specific teams were chosen by the Agile Coach, because it was believed the team leaders would be open to an interview and would respond in a timely manner. The researcher subsequently approached the Scrum Masters and Product Owners of the teams which in turn asked several team members if they wanted to take part in the research. This resulted in five more participants: two from the first team and three from the second team. Finally, the researcher approached the Release Train Engineer, who also agreed to participate in the research. Although the Release Train Engineer has no day-to-day contact with the teams, she could most probably provide additional insights with regard to their team leadership. The interviews were conducted in Dutch, because of the Dutch nationality of all participants. This way, all participants could express themselves in their native language.

	Participants	Internal/ External	Gender	Junior/ Senior	Code	Interview Guide
1	Scrum master of Team A	External	F	Senior	**SMA**	**Annex A1**
2	Product owner of Team A	Internal	M	Senior	**POA**	**Annex A1**
3	Team member of Team A	Internal	M	Senior	**TMA1**	**Annex A2**
4	Team member of Team A	External	F	Senior	**TMA2**	**Annex A2**
5	Scrum master of Team B	Internal	M	Senior	**SMB**	**Annex A2**
6	Product owner of Team B	Internal	M	Senior	**POB**	**Annex A2**
7	Team member of Team B	Internal	M	Junior	**TMB1**	**Annex A2**
8	Team member of Team B	External	M	Senior	**TMB2**	**Annex A2**
9	Team member of Team B	External	M	Senior	**TMB3**	**Annex A2**
10	Release Train Engineer of the Operations Train	Internal	F	Senior	**RTE**	**Annex A3**

Table 3.2 – Participants overview

Table 3.2 provides an overview of the participants. The composition of both teams including roles are found in Annex B. For Team A, the interviewed participants are representative for its composition regarding seniority and the ratio of internal/external hired team members. However, both interviewed team members fulfill the role of Information Analyst, in contrast to the rest of the team (see Annex B). Also, both women from Team A are interviewed, while the rest of the team consists of men. A better reflection of the team would have been achieved by interviewing a male Application Consultant instead of a female Information Analyst. The participants of Team B are fairly representative for the team composition. Only TMB1 can be qualified as a-typical in comparison to the rest of the team, because he is one of the only two junior members on the team.

Because the participants have different roles within the team and therefore have different perspectives regarding leadership, multiple interview guides are used. The interview guide for the Scrum Master and Product Owner, whose roles are more steering, is focused on the way they carry out leadership behavior and tasks, and on their perception of their leadership role. The team members' interview guide focuses on how leadership behavior is expressed by the Scrum Master, Product Owner and other team members, and on how this behavior is viewed and perceived. The two separate interview guides were composed in similar ways, using the constructed theoretical framework of paragraph 2.5 as a guideline for the content and order of the questions. This was done in order to provide the researcher a structured basis for data analysis. The composed interview guides consist of several questions that besides leadership behavior automatically touch upon the design of the teams and their tasks. When these

structural conditions came up during the interviews, the researcher would ask additional questions on this topic when this was necessary and appropriate in order to answer the research question.

Because the RTE is not part of the teams and has a completely different role, the researcher created an entirely new interview guide. This is focused on the fulfillment of leadership roles within the Scrum teams and on the way teams and their leaders have been coached throughout the transition of working agile.

3.3 Data analysis

In chapter two, nine categories of operational agile leadership behavior are distinguished. The interview questions are derived from these categories of leadership behavior (Annex A). Because this research entails a diagnosis of leadership behavior and team design, and not theory development, the recorded interviews are not fully transcribed. As each of the leadership behavior categories and their subcategories were predetermined, these applied as codes. Regarding the design of the teams and their tasks, two additional categories were distinguished: *group and task design & division of labor*, and *the nature of tasks.* Therefore, only the sections of the interview that belong to one of the categories were transcribed (Annex C). The coded sections were arranged by team, so that a comparison between the two teams could be made in the results and the discussion.

3.4 Research quality

3.4.1 Dependability vs. reliability

Reliability refers to the precision and accuracy of the data collection method and measures used (Boeije, 2014). In qualitative research, this positivistic approach is less applicable and thus a relativistic stance is a better fit. Dependability emphasizes the researcher's responsibility for describing the changes that occur in the research context and how these changes affect the way the researcher approaches the study (Pas, 2015). Regarding this research, dependability is warranted through writing memo's during data collection and frequent communication with contacts at the organization.

3.4.2 Credibility vs. internal validity

Instead of finding the best fit between interpretation and 'reality' (internal validity), the researcher should try to demonstrate a good fit between constructed realities of respondents and the reconstructions attributed to them (credibility). According to Pas (2015), this can be achieved in various ways:

- Prolonged engagement: going beyond superficial observation and spend enough time at the research site. The researcher worked multiple days at the organization. Therefore she was able to informally attend meetings and talk to various Scrum Masters.
- Peer debriefing: discussing research practices with a colleague that encourages reflexivity on the part of the researcher. This was done by discussing research practices with the researcher's supervisor and an Agile Coach on site.
- Progressive subjectivity: keeping a research diary of initial constructions of the research and understandings that developed during the research process, and subsequently checking to challenge initial understandings (assumptions). This was achieved by writing memo's during and after the preliminary research and data collection, and checking these during the different phases of data analysis.
- Member checking: testing perceived interpretations by discussing emerging results with interest groups throughout the research process. This was done by sharing the Dutch and translated English quotations that are included in Annex C with the individual participants. The researcher thereby extended the invitation to revise or complement their statements.

3.4.3 Limitations

A limitation of qualitative research is the fact that a researcher always influences the findings through interpretations during data collection as well as data analysis. It is also inevitable that a researcher is personally involved with the participants during interviews (Tijmstra & Boeije, 2011). Another limitation of qualitative research is the difficulty to draw conclusions in relation to the whole organization, when only a small group of people is involved during data collection.

3.5 Research ethics

Research has to be conducted with regard to general principles of acceptable behavior and practice. In a management research context, Anderson (2013) stresses the importance of considering the purpose and intent of the research, the way in which the research questions tend to be answered, the safety of the research participants as well as the researcher's own safety, issues associated with openness and honesty with everyone involved in the research and finally what the outcomes of the research will lead to (to what end the findings will be applied).

Regarding research ethics, the researcher's top priority is the protection of the interests of the participants (Anderson, 2013). Therefore it is necessary to take into account the benefits and the burdens of everyone involved (Sieber, 2013). With respect to maintaining relationships based on trust and respect with the participants, it is important for them to know whether or not anonymity is achieved during the research. Although in the case of Company X anonymity

outside of the organization is guaranteed, the VP's and other higher placed employees of Company X will know which members of the IT teams and other employees participated in the research. Therefore it is addressed at the beginning of every interview that anonymity within the organization cannot be assured. Furthermore, confidentiality concerning the research data and findings is a serious subject. With Company X the arrangement has been made to not distribute any data or findings and to anonymize any document that will be stored at the Radboud University (Anderson, 2013). Finally, the main contact at Company X is continuously kept up-to-date regarding the progress of the research so that any concerns could be taken into account.

During the data collection, research ethics were certainly kept in mind. Before starting the interviews, participants were notified about the intention and content of the research. While interviewing, the researcher tried to fully retain an unprejudiced attitude to not steer the participant in any way. After the interviews were finished, the researcher asked for feedback to improve in the run up to the next interview. Finally, the researcher granted the participants the opportunity to revise their answers and allowed them to suggest amendments that enhance accuracy, fairness and relevance (Anderson, 2013). Except for one, every participant used the opportunity to check their statements. Five participants asked if the researcher could rephrase a few statements, but no one asked for comprehensive alterations. Notable was that after reading their statements, the Scrum Master and Product Owner of Team B separately remarked their interviews seemed pretty focused on things that did not go well. They wanted the researcher to know that the team also achieved some good results. In spite of this, they both still supported every answer they provided during the interviews.

4. Results & Analysis

In this chapter, the results and analysis are presented. The first paragraph focuses on structural aspects of the agile teams and their tasks, because a specific way of working presumes certain conditions regarding group and task design. In the second paragraph, the fulfillment of the Scrum roles are discussed in general. In the third paragraph, the specific leadership behavior drawn up in paragraph 2.5 will be addressed. Paragraph 4.1 and 4.2 serve as a base to enhance understanding of the results in paragraph 4.3. In paragraph 4.4 and 4.5, a summary of the results and a cross-item analysis are presented.

The results are shown by means of paraphrases and quotations. The complete results can be found in Annex C. In every paragraph, an analysis of the results is provided. In the analysis, the researcher mainly focused on the different perspectives of the separate roles of the participants. The respondents and documents referred to are indicated by the abbreviations shown in Table 3.1 and Table 3.2 in paragraph 3.2.

4.1 Group design, nature of tasks & division of labor

While the interviews were focused on leadership behavior, issues regarding team design and the division of labor were brought to light in almost every interview. The researcher decided not to ignore these statements, in spite the fact that they do not fit in the scope of this thesis. This choice was made, because certain design conditions need to be met in order for teams to be able to work in an agile way (see paragraph 2.1.3).

Results

The results show there are three structure related issues present within the teams. POA, SMB, POB, TMB1, TMB2, TMB3 and RTE all expressed during the interviews that the teams of the Operations Train consist of specialists working in a team. TMB3 explained that his team is a generic team that manages a big amount of applications, without having any core competences or services. In practice, this means that everyone on the team works on their own individual Sprint goals, parallel to the other team members. This is also the case in Team A. POA shares that often all team members work on their own specialty, and that two people working together on one topic is the maximum amount.

Furthermore, POA, TMA1, TMA2, SMB and POB share that the work on innovation projects in the form of user stories is often disturbed by incidents that need to be solved. These are either ad

hoc questions from the Operation,[2] or production issues that need attention, as POA and TMA2 explained.

"We mostly have issues with incidents, production issues. That takes up a lot of our time, mostly from the Application Consultants. Instead of focusing on innovation, they are mostly dealing with solving production issues. I think that is inherent to the way the IT-landscape at Company X is designed, which is not optimally set up." –TMA2

In Team A, thirty percent of the work was devoted to solving incidents at the time of the interview, TMA1 shared. SMB recognized that working on user stories and solving incidents are two things that are not compatible. POB also noticed that planned work is often intersected with incidents that need ad hoc attention.

The third issue was raised by SMA, TMA1, SMB, TMB1, and RTE. The latter explained that the teams mainly work with off-the-shelf packages that are delivered and shaped by third parties. SMA and SMB further clarify that these dependencies cause a lot of waiting and uncertainty. Therefore, tasks often cannot be finished within one sprint. SMA even refers to this as working in small waterfalls, because team members constantly have to wait for suppliers to get back to them before they can resume their work on user stories. Sprint goals are often not met, and user stories subsequently have to be transferred to the next sprint.

Because of these issues, SMB and POB are not sure if the Scrum method fits their team. At the time of the interview, they were therefore planning to restructure Team B. By reconsidering the division of the three teams in the Crew Planning domain, they hope to create more focus for all teams. The restructuring will be focused on distinguishing between long-term and short-term innovation projects, as POB explains.

Analysis

As the results show, the team members, both Scrum Masters, both Product Owners and the Release Train Engineer all recognize one or more structure related issues with regard to the teams. When comparing these three issues to the ideal design conditions of agile teams in paragraph 2.1.3, it becomes clear that Team A and B are not quite compatible with working agile in terms of team and task design. Instead of working together because of interdependent tasks, individual team members work on their own projects, parallel to their peers. Moreover, instead of working on one project (Cohn, 2010), the teams are working on both innovation projects and support tasks at the same time. When a production issue occurs, or the Operation has an ad hoc

[2] The 'Operation' is the customer (the cabin and cockpit crew, and the technical service) of both teams with whom they must work together following agile principles. Regarding terminology, the participants sometimes use 'the Business' instead of 'the Operation'.

question, work on user stories (innovation projects) often has to be put on hold. Lastly, both teams are having trouble maintaining a high velocity because of the dependencies with third parties. Ideally, an agile team has to be able to remove impediments to their process and solve their problems with their own resources (Denning, 2015; Kuipers et al., 2010). However, most of the time Team A and B are not able to influence third parties, and are forced to wait for contact.

4.2 Fulfillment of Scrum roles

The Scrum teams in the IT department of Company X all have a Scrum Master and a Product Owner. This paragraph focuses on the perception of these roles from the different perspectives of the participants.

Results

With regard to her role, SMA explained that it includes more tasks than an average Scrum Master profile. Scrum Masters at Company X need to be able to sit down and negotiate with external contacts, for example to agree upon a new work method. SMB also believes the elaboration of the role of Scrum Master is too limited considering the environment and the type of user stories the team handles. The job description of a Scrum Master at Company X lists the following tasks:

Ensuring the application of agile values, principles and practices by the team; facilitating meetings; removing impediments; ensuring velocity, product quality, and teamwork is kept on the desired level; coaching and guiding the team in their day-to-day work; being a servant leader to the team; help get the best out of the team members in terms of teamwork, self-organization, and personal development. –Doc2A

These listed tasks largely correspond to the leadership behaviors the researcher distinguished in paragraph 2.5. However, these do not fully cover the tasks of agile leaders at Company X according to SMA and SMB. TMB3 shares the same opinion. Because of the group design discussed in the previous paragraph, he believes that being a Scrum Master or Product Owner to these teams requires a different form of leadership. To fulfill these roles, one has to have knowledge about the specifics of the team and adapt one's management style accordingly.

"For you it is relevant that a Scrum Master, instead of only focusing on the behavior of people, also focuses on structure and steers the process. Because the one influences the other." –TMB3

How the Scrum Masters and Product Owners fulfill their role, is up to them. At first, SMA believed this was a good thing, but at the time of the interview she saw this differently. Because all Scrum Masters within the train use a different approach, team members cannot expect the

same from every Scrum Master. By coming together in a 'chapter', Scrum Masters try to overcome these differences. The Product Owners used to have a chapter too, but POB explained that the variety of people and their tasks were too large to be discussed properly. Therefore, POB talks with individual Product Owners about how to handle certain situations. POA on the other hand, does not talk with other Product Owners about day-to-day issues.

SMA explained her assignment is to let the team grow and to get the team to work more efficiently. SMB believes in servant leadership; to facilitate the team so that the team members can do their work. The opinions of the team members regarding the roles of the Scrum Master differ per team. While TMA1 and TMA2 have a positive stance, TMB2 believes the role of SMB gets blown out of proportion, and is made bigger than it has to be. TMB1 seems unknowing about the fulfillment of the role, as he shared that he does not really know how SMB fills his days. TMB3 believes SMB and POB are doing the best they can with the challenges they face because of the team structure.

In Team A, the distribution of tasks between the Scrum Master and Product Owner seems to be by the book, although SMA sometimes makes notions regarding the content. In Team B, this division is less clear. As POB shared, this is mostly due to the fact that both SMB and POB were new to working with Scrum in an agile manner. They jointly weighed how to handle certain situations, and how to find a balance between the theory and their affinity. POB tries to prioritize clearly and to focus the team, while the SMB takes action regarding the enhancement of processes. But that segregation is not black and white. This is illustrated by TMB1:

"The Scrum Master is more engaged with the technical part of the Scrum Team. He does organize demo's and retro's and those things, which I do attend. He also comes to me with new stuff and asks me if I want to take that on. So in that sense he sometimes does things that belong to the Product Owner." –TMB1

Moreover, RTE explained that most internal Scrum Masters that come from Project Management roles are also interested in the content of the teams' work. However, the role focused on the content of tasks lies with the Product Owner. RTE has noticed that some Scrum Masters believe their role, which is more focused on the process and team development, is not the right fit for them. TMB2 even believes some Scrum Masters truly dislike their role.

Analysis

Because of the group and task design, and the nature of the tasks both teams carry out, the role of Scrum Master in the Operations train deviates from a normal Scrum Master role. Fulfilling this role for example entails continuous tuning with external suppliers, and dealing with long waiting

times in combination with two-week sprints. As TMB3 stated, a Scrum Master within this context has to focus on the structure of work and teams as well. An example is provided in the previous paragraph: SMB and POB both engage in restructuring their team in order to improve the compatibility of their team and Scrum.

The fulfillment of the Scrum Master role is perceived differently by the team members. TMA1 and TMA2 have a positive stance towards SMA. TMB2 believes the role of Scrum Master is made into a bigger deal than it has to be within Team B. TMB1 seems indifferent about the fulfillment of the role of SMB, as he does not know what SMB does on a day-to-day basis. However, he does indicate that SMB sometimes fulfills content-related tasks that belong to POB. RTE recognizes Scrum Masters that come from a Project Manager role are often interested in the content of a team's tasks and are therefore not sure if they are comfortable with their Scrum Master role.

4.3 Leadership practices

4.3.1 Coaching in self-organization

Results

SMA stated that Team A is still at the start of their development as a self-organizing agile team. SMA notices this because some team members still expect her to hand out tasks. She deals with this by explaining that she does not hand out tasks, that the team decides what to do and how to work; the team should thus figure it out. On the other hand, SMA is aware of the fact that she sometimes asks for a status, as that is still necessary with some of the team members. This can in her opinion be qualified as a form of leading by example: to show the team that they have to inform each other about statuses. POA believes that it is necessary to follow the team in their needs. If the team wants to do a stand-up only two times a week, or two times a day, that is fine. TMA1 thinks the team is fairly independent. The team however does receive guidance from SMA, who introduces new topics at the rate and to the extent the team prefers and decides upon. TMA1 further believes the team is truly responsible for their work. When it comes to his work, he is free to carry out tasks the way that suits him best. Both TMA1 and TMA2 expressed that the team is not told what to do and how to work. TMA2 explained further:

> *"The Scrum Master does not say how to do execute our tasks, but she indicates when things maybe can be done better. It is then up to you to see if you can and want to do things differently."*
> –TMA2

Team B is a starting team as it comes to self-organization as well. SMB explained that he first and foremost tries to make people more conscious about how to handle certain tasks. If he can achieve that, the team will be more self-organizing. But this is very hard. He had hoped the team

itself would take on tasks and work independently, but that is not the case. Therefore SMB tries to coach the team by starting conversations with team members and using different techniques like the 'seven coaching questions'. However, he finds that it is not easy to get people moving and self-organizing. Sometimes he recognizes that when the team has never done something before and is consciously incompetent, it helps to explain more when he feels the team is not going it figure it out on their own. SMB believes that when he uses directive leadership work gets done faster, and sometimes it is difficult for him to let go of that feeling. The Product Owner of Team B recognizes this feeling of falling back into the role of a Project Manager. He explains this as follows:

"There is a difference between the <u>what</u> and the <u>how</u>. I, as a Product Owner, say what I want and in which order: 'Good luck with it, choose a direction for a solution, how you want it to be implemented, what you want.' This sometimes works, but often I see it does not, and then I unconsciously fall back into the role of Project Manager. That is because we have a lot of initiatives going on at the same time. On the one hand we find it hard to focus on things within a small time frame, and on the other hand because the environment is not aligned yet. Because we are working on 8 features at the same time I sometimes feel as the Project Manager of 8 projects: to keep an eye on them and to make sure we are moving forward. But I prefer not to do that. I prefer saying: 'I want this feature, here is its priority: work on it and I will hear it when it is ready.'" –POB

POB believes it is hard for the team to be self-organizing because team members need a lot of coordination skills to be able to keep all separate projects up and running. When this does not go as it should, he intervenes if that is necessary. Furthermore, he helps the team by setting timelines and providing boundaries within which the team can carry out their tasks. POB gives the team responsibilities and expresses this towards them, but he still thinks it is hard to find the balance between striving for team responsibility and ownership, and making the decisions himself.

TMB1 does think that the team is self-organizing. Steering roles for the Product Owner and the Scrum Master according to him are self-evident, because he believes it is their responsibility. TMB1 has a lot of freedom as it comes to the execution of his own tasks. However, this depends on his role, and is for example not the case for a tester. TMB2 recognizes the issues raised by the Scrum Master and Product Owner regarding their tendencies to fall back into a Project Manager role. He sees that happening in the team, when sometimes SMB takes on a steering rather than a coaching role. He further explained:

"Former Project Managers often have a lot of knowledge on a detail level of the team's work. So it is a real pitfall for them to keep asking about aspects of work on this detailed level, to manage related to content, and to hand out tasks on a micro level." –TMB2

RTE recognizes the tendency of team members to turn to the Scrum Master or Product Owner to lead them. But she believes the teams will grow into self-organizing behavior as they mature.

This topic was not discussed during the interview with TMB3.

Analysis

While both teams are still at the beginning of their development in becoming a self-organizing team, the coaching of Team A seems to go more smoothly than the coaching of Team B. Within Team A, SMA seems to have found a way to coach the team in self-organizing behavior without pushing the team. This is also felt by both team members, as it is reflected in their statements.

The SMB and POB both come from a Project Manager position within Company X. They try really hard to give the team members more responsibility, but they are not yet up for the tasks of managing and monitoring their work. This is partly caused by the fact that the team's work consists of multiple separate projects. Therefore it is difficult for the SMB and POB to find a balance in coaching the team on how to do certain tasks and to know when to withdraw (Tabaka, 2006). This seems to lead to some frustration, which in turn seems to result in a greater lack of trust and believe Team B can self-organize (Russell & Stone, 2002). The opinions of the team members are divided. TMB1 believes a more steering role of SMB and POB is logical. Individually, he is free to do his work the way he pleases. TMB2 recognizes the issue with regard to Scrum Masters that are former Project Managers, as it seems hard for SMB to let go of getting involved with the work content-wise on a detailed level (Appelo, 2011; Thomas, 2000).

4.3.2 Coaching in agile & Scrum

Results

The amount of experience with agile and Scrum practices of the Scrum Master, Product Owner and team members of both teams diverge. SMA and TMA1 both have several years of experience as a Scrum Master. TMB2 and TMB3 both have sufficient knowledge, whereas POA, SMB, POB, TMA2 and TMB1 have no prior experience with working agile. In coaching the teams to work according to agile values and principles, SMA explained:

"For me, that is normal, and you strive for it to be normal for the team. Repetition is very important in that matter. To explain things often and tell them <u>why</u> we do certain things. And if it does not stick, you explain it in a different manner." –SMA

POA leaves this task up to SMA most of the time, but he sometimes joins in. TMA1 recognizes that SMA helps the team to grow in using Scrum. New aspects of Scrum are introduced slowly and in a proper manner according to him. Furthermore, because of his experience with Scrum, TMA1 can assist and step forward as a leader when it comes to teaching the rest of the team. In accordance, TMA2 indicated that SMA teaches the team about the importance of the different Scrum meetings, and that TMA1 regularly steps in as it comes to the content of Scrum.

For SMB and POB coaching the team is a lot harder, as this is the first time they work with Scrum. POB explained that he notices that it is a quest for them, because he does not have any examples of an ideal situation in which he gained experience, nor does SMB. However, Team B does have a few team members that have a lot of experience with agile, so they can contribute to figuring out how to handle tasks in an agile way. Still it remains difficult to get on the same page with the whole team regarding how to carry out tasks following agile principles, TMB3 explained. Team members with different roles have different ideas about what agile means in various situations and this raises discussions within the team. TMB2 only commented that SMB draws attention to agile practices by using post-it's. TMB1 works in Team B since May 2017 and at the time of the interview (August 2017) he did not receive an agile or Scrum training yet. He does not seem to know the meaning behind agile practices.

RTE stated that the education on agile and Scrum principles and practices for the whole train is insufficient, and has been from the start. Everyone within the IT organization that had no prior experience with agile and Scrum received only one training. Moreover, Doc3A slide 8 shows that addressing agile values, principles and practices was deliberately not covered in the workshops for Scrum Masters and RTE's. Since six months there are two Agile Coaches, but RTE sees that this is not enough for coaching two whole trains. TMA1 notices this lack of knowledge:

"Doing Scrum to a lot of people here means: I am standing in front of a Scrum Board every day for 15 minutes. Within my team I know not everyone has had a Scrum course and you would expect that to be the case if you have to work that way. A while ago I taught a Scrum course to the Technical Service and a couple of my team members also attended, and for them it was: 'oh, is that what in entails?'" –TMA1

Analysis

SMA seems to be coaching and mentoring as Adkins (2010) prescribed; by explaining the core Scrum and agile practices and the 'why' behind it. This goes well because of SMA's previously acquired knowledge and experience as a Scrum Master. Also, TMA1 can step in as a leader when it comes to coaching and mentoring his team mates. The results show that SMA's and TMA1's leadership roles with regard to this topic are well received by both interviewed team members.

However, TMA1 recently noticed that the knowledge of his team members is not at the level it should be.

For SMB and POB it is a lot harder to coach Team B in agile and Scrum practices and principles, as they both have no previous experience working agile. The interviewed team members have varying knowledge of agile and Scrum, and also have a different stance to working agile. TMB1 has little knowledge of the meaning behind the practices. TMB2 only expressed that SMB tries to pay attention to agile and Scrum by using post-it's. TMB3 recognizes SMB and POB try to spark conversation on how to effectively use agile practices within the team. He however also notices that because of the varying roles, it is hard to find common ground on this topic.

RTE recognizes the level of knowledge on agile and Scrum within the teams is too low, and knows more coaching capacity is required for improvement. It is however notable that during the workshops for Scrum Masters and RTE's, this topic was excluded as Doc3A shows.

4.3.3 Facilitating meetings

Scrum describes the following types of meetings: daily stand-up, retrospective, sprint planning, and inspect & adapt. To keep the extent of this topic within limits, the researcher has made the choice to cover the daily stand-up and retrospective, as these are discussed in paragraph 2.5.3 and in every interview.

Results

In Team A, SMA strives for the team to carry out the stand-up. TMA1 shared that SMA does not pick someone to start the meeting; that goes naturally. TMA2 explained that when the team was newly formed, stand-ups were taking a long time – sometimes a half hour. This has improved over time under the supervision of SMA. Regarding the course of the stand-up, SMA explained that team members often expect her to assign turns, or directly address her instead of each other when they are answering the three questions.[3] When team members search for confirmation with SMA, she ignores the looks to point out the team should determine what to do. Moreover, POA shared that when the conversation during the stand-up is taking too long, SMA intervenes and manages the conversation to get the team back to the core. This was expressed by TMA2 as well. When SMA or POA are not present during the stand-up, the team takes over the meeting.

"If the Scrum Master or Product Owner is not present at a stand-up, it still takes place. There is always somebody on the team who takes on that role. I am happy with that, because it indicates team maturity; they carry on following the approach we agreed upon." –POA

[3] For the explanation of the three questions during a stand-up, see paragraph 2.5.3.

During the retrospective the team reflects on the sprint. POA does not prefer to use terms as 'team happiness' or 'sprint happiness',[4] but rather talks about notable matters and aspects from the previous sprint that can be done better. Subsequently, these remarks are linked to actions in order to achieve improvement. SMA and TMA1 shared the same, however SMA believes the follow-up on the agreements made during the retrospective could be handled better. According to SMA, team members regularly seem to forget the agreements during the walk back to their seat.

In Team B, SMB lets the team carry out the stand-up as well. He explained there usually is one particular team member to step up to the plate and initiate the stand-up. SMB recognizes that several other team members find it difficult or scary to undertake this. Therefore, when nobody is willing to initiate the stand-up, SMB takes over.

Team B's stand-ups deviate from the prescribed Scrum format. TMB1 and TMB2 explain that instead of adhering to the three questions, Team B discusses the whole backlog from top to bottom. When the team runs into an impediment on the backlog, the person who is responsible for the corresponding story shares the problem and when it is expected to be solved towards the rest of the team. TMB3 provided more insight regarding the reason why the stand-up is performed this way. In 'normal' Scrum, in which a team as a whole has to work together on one project to reach the sprint goal, the three questions are a good means for team members to get on the same page and coordinate their activities. However, within Team B team members work on their own tasks on smaller projects. Thus, as TMB3 explained, the answers to those three questions become less relevant:

"The team and the work is very diverse and does not interact with each other much. So I have nothing to tell you and you have nothing to tell me, because I'm working on something totally different. And then we do [the stand-up] because we have to, and I speak to the Scrum Master, because he is the only one who wants to know. For another team member, it isn't relevant. If we had focused work it would be relevant; then I am working on something that has an impact on the work you are doing, because we work on the same topic." –TMB3

Thus, to keep the team on track, SMB points out the stories at the top of the backlog during the stand-up, because team members often work on tasks with a lower priority. TMB2 questions if this approach to the stand-up complies with an agile way of working, because it focuses on the work the Scrum Master wants to get done, instead of the team. TMB1 believes having a stand-up

[4] These are terms that are used by some Scrum Masters at Company X to start a conversation with a happy or unhappy emoticon provided by every team member. This was seen by the researcher during the preliminary research at another team from the Operations train.

every morning is unnecessary, and he calls it a 'charade'. He has the notion that problems just need to be handled when they arise. He would rather ask for help when he encounters an impediment, than discuss the same thing every morning. Therefore, having a stand-up twice every week would be sufficient in TMB1's opinion.

During the retrospective, Team B evaluates the previous sprint and decides what can be done better, as TMB3 affirms. SMB always tries to come up with a new approach in order to excite the team. For example, one retrospective he used a sailboat as a metaphor. He asked the team at what moment during the sprint they experienced tailwind and when it turned to headwind. Ideas like this were discussed and encouraged during the workshops for Scrum Masters and RTE's (see Doc3D). However, TMB2 believes SMB sometimes takes it too far regarding the measuring of team and sprint happiness:

"[Team development] is certainly being done, but we have to find a realistic way. It wouldn't hurt to coach Scrum Masters more without them being buried under a theoretical framework. […] I have got the feeling that the Scrum Master goes overboard regarding team spirit and team happiness. It gets too much of a woolly hassle. We have to be realistic regarding Scrum not being the goal, but a means." –TMB2

Finally, TMB2 shared that he misses the invitation during the retrospective to give feedback to SMB and POB. In his opinion that would be a good addition because the Scrum Master and Product Owner are on the same hierarchical level as the rest of the team.

RTE does not know how and what is discussed during the retrospective of the teams, unless it is actively discussed during the Scrum of Scrums, which is a meeting with all the Scrum Masters from the Operations train.

Analysis

SMA coaches the team to own the daily stand-up by avoiding eye contact with team members, and intervening only when it is necessary for the course of the meeting (Adkins, 2010). From the results, it proves to be particularly difficult for Team B to execute the stand-up as it is meant in the theory on Scrum. For Team B, answering the three questions every day defeats the purpose of the stand-up, because the team members work separately on their own tasks and projects. SMB recognized the team members were not gaining any advantage during the stand-up, so he decided to change it in order to create more focus. However, discussing the whole backlog from top to bottom every day does not work for the team members either. TMB1 believes meeting every day is still not relevant, and TMB2 believes the stand-ups are leaning towards SMB's view of what should be done, instead of the team's.

During the retrospective, both teams evaluate the previous sprint and agree upon improvements concerning the next sprint. The difference between the teams can be found in how the retrospective is conducted. POA shared he just starts the conversation, and SMB makes use of original ideas and metaphors. While the latter was encouraged in the workshops for Scrum Maters and RTE's (see Doc3D), this is not appreciated by TMB2, who thinks SMB attaches to much value to determining team and sprint happiness.

Finally, results of both teams indicate that the stand-up and other meetings are a good starting point to exercise shared leadership, as team members can take on a leading role by initiating the meeting.

4.3.4 Guiding & setting direction

During the interviews of SMA, POA, SMB, and POB, it became clear that guidance of both teams is mostly directed at creating focus and finding more effective ways to work.

Results

SMA explained that she creates opportunities for the team to try new methods and tools. When one of the team members approaches her with an idea, SMA creates space for him or her to explore the idea further. For example, TMA1 pitched to try 'user story mapping'.[5] SMA subsequently brought in one of the Agile Coaches to give this a try together with the rest of the team. Furthermore, SMA expresses her own ideas towards the team concerning matters that could be changed for the better. This encourages the team members to constantly improve the way they work, for example concerning the stand-up, e-mail, getting things done and user stories. This is affirmed by TMA2.

Both SMA and POA help the team to maintain focus. POA explained the team is sometimes swayed by the issues of the day, because it supports an operational department of Company X.

> *"If we are more occupied with operational support – incidents – rather than user stories, we tend to lose focus on the Scrum Board. The question is: is this even an incident or is it a feature request? And does it have priority relative to the planned work? The Operation is used to be serviced at any given time. But not everything they ask deserves priority."* –POA

POA helps the team to determine if an inquiry from the Operation is considered an incident that has to be solved right away. When this is not the case, the question is treated as a feature request and will be addressed during the next sprint planning. TMA2 acknowledges the importance of POA's guidance, because of the team's multiple-item portfolio. SMA helps to create focus as well.

[5] With user story mapping, user stories are arranged into a model useful for different purposes.

"Sometimes people have the tendency to add new tasks during a Sprint, while normally after a Planning session, you do not alter the board anymore. The Scrum Master will then ask: 'Are those mentioned on our Scrum Board? Is that really necessary?' She approaches us by asking questions, and not by stating: 'You cannot do that.' That way, the Scrum Master is guiding us. This triggers the team to think about it, and we ask ourselves if it is a good idea or not. The Scrum Master asks these questions in a very subtle and natural way, and this works very well." –TMA1

POB explained that SMB and himself spend time on enhancing the way Team B works by trying different approaches in order to figure out the most efficient one. Team members start to think along when they are asked to; they usually do not spontaneously come up with own ideas.

Moreover, both SMB and POB are guiding the team by emphasizing the importance of getting things done. POB achieves this by prioritizing clearly, and by challenging the team to not spread their work across the whole product increment,[6] but to deliver results in two weeks. SMB keeps the team focused by asking them questions about progress during the stand-up. In spite his good intentions, these kind of questions sometimes counteract, as POB shared:

"I think the Scrum Master is more conscious than I am in trying not to take on the role of Project Manager. But I do see it happen. […] He then gets stuck in asking suggestive questions: 'Why wouldn't you do this..'. Then it may seem you leave it up to the team, but this way you are not really laying the responsibility with the team." –POB

While TMB3 recognizes maintaining focus is a big challenge for the team, TMB1 does not see that. TMB3 believes SMB and POB can really enhance focus by restructuring the team, which is on the agenda.

This topic was not discussed during the interviews with TMB2 and RTE.

Analysis

In both teams, the Scrum Master and Product Owner try to get the teams to focus as much as possible. In both teams, questions are utilized for making team members aware of opportunities of working more focused. TMA1 qualifies SMA's questions as subtle. POB on the other hand provided an example in which SMB uses suggestive questions. However, this is not brought up by the team members of Team B.

In finding ways to work more effectively, the Scrum Masters and Product Owners from both teams try to come up with new ideas. In Team A, these ideas also come from the team members.

[6] A product increment is a period of five sprints (10 weeks).

The team members from Team B are not contributing spontaneously with new ideas to continuously improve their ways of working.

4.3.5 Facilitating whole-team decision-making

Results

When a decision has to be made in Team A, SMA tries to lay the decision back with the team when one of the team members approaches her. Whole-team decision-making usually occurs during the daily stand-up or during a planning session in consultation with POA. During the stand-up, members resonate with SMA, but ultimately the team is asked what the decision will be. If this does not work out, SMA makes the decision. Hereby SMA tries to maintain speed and keep the rhythm in order to prevent stories to come to a halt:

"On moments the team is not able to make a decision, me or the Product Owner makes the decision. On the one hand you could be very persistent in wanting the team to make the decision, but if the team does not figure it out, I make the call." –SMA

TMA1 shared that decisions are always made after deliberation. There is not one particular person that states how the team should handle an issue. Although everyone gets a chance to participate in decision making, SMA remarked there will always be people during deliberations that speak immediately and people that are more quiet. SMA and POA try to provide time and space to team members who are more quiet. This particular subject was discussed during a teaming session. SMA asked certain people why the team never hears them during deliberations. The answer 'I am more quiet' is too easy in her opinion; everyone on the team should try things outside of their comfort zone. This is encouraged by SMA and POA. TMA2 recognizes this. During the drafting of the team's work agreements, the participative decision-making did not go well. It was intended for every team member to assent with the agreements made and to express this out loud. This was not easy for everyone. She further shared:

"Most of the time someone has to sit with us [when decisions have to be made]. We have the tendency to repeat the same thing over and over again or to not say anything at all. […] The facilitator usually is the one that says: 'Does everyone agree now?'" –TMA2

In Team B, most of the time one particular person on the team tries to mobilize the team. SMB explained that most changes and decisions on how to handle certain tasks are initiated by him and are simultaneously carried by the whole team. By giving every member of the team a voice and the opportunity to contribute to decisions, Team B strives for consensus. However, SMB shared that there are always a few people out of the nine team members that do not seem to care.

During the interview, POB came to the realization the team has not yet agreed upon a systematical approach to decision-making. He furthermore recognized that the team often muddles along when a decision has to be made:

"Everybody can have a say, but we do not really have a decisive team. It often happens we have very long discussions that do not always end with a decision. Sometimes I let that happen, so that the team comes up with a decision themselves. And sometimes I say: 'we have left and we have right. I think left is the most useful, so let's do that.' That sometimes works, but sometimes I get a counter reaction: 'who are you to decide that, we are the that makes the decisions, right?' But if the team does not figure it out, I tend to make the decision." –POB

As a nuance, POB stressed that this is not always the case. The interviewed team members of Team B were not exactly clear on the topic of whole-team decision-making. It seems that a lot of decisions are made within a smaller group, because they touch upon subjects that do not concern the whole team, as TMB1 explained. He does not believe that a lot of decisions are made by the team as a whole, because of the specialist tasks of the team members. TMB3 does recognize the indecisiveness of the team in group decisions, but did not explain how this is handled by SMB or POB. TMB1 and TMB2 further share decisions related to their individual tasks are mostly made in consultation with POB.

This topic was not discussed during the interview with RTE.

Analysis

Both Team A and B appear to be struggling with similar issues as it comes to whole-team decision-making. In Team A, some of the team members are not keen on giving their opinion or actively participating in the decision-making process. This seems mostly because of their more introvert personalities. SMA handles this by challenging these team members to speak their mind, because decisions belong to the team as a whole.

Within Team B there are also a few team members who are more quiet and therefore not inclined to participate in decision-making. SMB even believes that some team members do not care at all. Taking into account the statements on this topic from the team members of Team B, it seems like they often believe a decision does not affect them, so they stay out of it. That may be a reason for the indifference SMB experiences.

Finally, the Scrum Masters and Product Owners on both teams seem to frequently take over decision-making. With regard to the starting phase of self-organization both teams are in, this is understandable (Appelo, 2011; Tabaka, 2006).

4.3.6 Facilitating teamwork and encouraging knowledge sharing

Results

Because of the nature of the tasks both Team A and B carry out, teamwork is a topic with some difficulties attached to it. As is stated in paragraph 4.1, the user stories on the backlog of the teams rarely ask for a whole team effort; the backlog is mostly comprised of specialized tasks that are connected to one or two designated people on the team. In spite of this, Team A has found a way to work together to some extent:

"If a team means working together, then you are not a team in this situation. If a team, apart from the fact that members work parallel to each other, means questioning, challenging and supporting each other, then you are a team in my opinion." –POA

SMA admitted that the difficulty to work on a story with multiple people, is a recurrent subject within Team A. Therefore SMA devotes more time to one-on-one knowledge sharing. Furthermore, the team organizes additional refinement sessions since June 2017. That way the team can jointly talk about user stories more often. Until then, every story was connected to one specific expert on the team, SMA explained. Because all team members did specialized work, nothing was shared with each other. Since knowledge is shared more, every application is connected to two experts on the team. In accordance, POA explained that the team tries to become multi-disciplined, to prevent dependence on a single person as much as possible. All team members are expected to be wanting to learn about each other's work. That is why POA leads by example, showing he too wants to understand the technical side of the tasks the team engages with. When whole team knowledge expands, team members can challenge each other, and that way the team can gain more from doing a stand-up. Moreover, POA shared that he always takes a team member with him to an appointment, so that multiple people are informed about what is going on in the business. TMA1 recognized the importance of learning more and more about his team members' work to be able to work together.

"We really want to become T-shaped, which entails knowing more about different disciplines. That is why we are asked frequently if people want to join in on working on a certain topic to learn more about it. More and more I see two people working together on a subject. The Scrum Master does not have to initiate that, that goes naturally." –TMA1

When it comes to sharing knowledge, the team members take the initiative most of the time. For example, SMA shared that the team organizes knowledge sharing sessions themselves. After she initiated a first session for user story mapping, the team arranged the second and third session without the help or knowledge of SMA. Moreover, TMA1 shared that SMA hardly has to play a role in ensuring that team members work together; Team A is a positive team and everybody

wants to help each other. This is confirmed by TMA2, as she explained that the team members are very interested in other tasks, and therefore gladly join in on each other's work.

In comparison to Team A, Team B is an even more diverse team in terms of technology skills and types of people, as TMB3 explained (see Annex B). This means teamwork is not always on the agenda. TMB3 believes this is not the case because people do not want to work together, but because parallel workflows exist within the team and individuals are working on their own sprint. TMB2 recognizes this. Because of the single points of knowledge, sharing one's knowledge is not always possible, because it is just too complicated for another team member to understand. SMB does try to encourage teamwork on the one hand by making the suggestion, but also by praising team members when they are sitting together on their own initiative. But when SMB asks team members to sit together and work on a solution together, it often happens that they keep focusing on their own work:

"They just do not do it. I often propose the suggestion: 'can't you just try it, to just sit together with the team and talk about it and come to a solution?' But it is like 'no, I have to prepare something else..' They just aren't there yet." –SMB

In accordance, TMB1 explained most of the time he is busy with his own tasks, as he likes to work alone. Even the tasks belonging to the role of Business Developer are divided between him and the other Business Developer on the team.

When there is an opportunity for the team to work on a feature as a whole, POB usually is the one to indicate which feature is suitable. If the team sees that too, POB takes a step back to let the team take on the work together. Then he notices that team members who have knowledge of certain features and systems rise to the occasion. Furthermore, POB does see some bottom-up initiatives from the team, for example when it comes to documenting and sharing the needs of people on the team. This is affirmed by TMB2. Also, POB also sees that some tasks are jointly taken up by the team. Because of this, he does not additionally encourage teamwork in particular.

In light of the nature of the team's tasks, RTE remarked that it is necessary for the organization to provide some clarity on how the teams are supposed to be working together.

Analysis

The fact that the tasks of the teams are specified and divided according to the different roles of the team members, teamwork and knowledge sharing are not self-evident. Within Team A, SMA and POA encourage knowledge sharing by leading by example (Van Dierendonck & Rook, 2010), and devote time to establish one-on-one knowledge exchange. Now, team members seem eager

to know more about each other's work and display shared leadership, for example by organizing knowledge sharing sessions on a specific topic of their expertise (Appelo, 2011).

In Team B, the variance in work and roles is even bigger, because developers and testers are part of the team as well (see Annex B). Therefore team members of Team B are often not able to share their knowledge or work together because their tasks are too specialized. This seems a structure related barrier to reaching the state of a coordinating team (Adkins, 2010). In spite of every team members having separate tasks, SMB still tries to encourage team members to work together, often in vain. POB does see some bottom-up initiatives regarding internal team matters. On the few stories that can be handled as a team, the team does work together on the initiative of POB.

4.3.7 Managing the context

The context must be managed in order to shield the teams from disturbance of their process. Regarding the interviewed teams, context-related impediments were mainly caused by dependencies with entities outside of the teams and by dysfunctional organizational practices. Therefore, this paragraph has been divided into the topics: 'managing stakeholders' and 'interfering with dysfunctional organizational practices'.

Results

Managing stakeholders

External suppliers and the Operation are two of the most important stakeholders for both Team A and B. Regarding external suppliers, the biggest issue is the traditional way most suppliers still work. This means that they are not accustomed to working together with a company that expects products and services to be delivered every two weeks. As a result, both teams struggle with long waiting times, and a loss of control on the progress of their tasks. This is expressed by SMA, TMA1, SMB and TMB1.

The only solution, as SMA explained, is to make sure external suppliers go along with the team's agile pace, which means delivering software to the team regularly. To this extent, SMA has made a draft tender for a new supplier concerning one of the applications, in which she included this condition. Moreover, to make the issues regarding these dependencies visible, SMA has introduced a 'waiting' column to the Scrum board.[7] TMA1 does not see any real solutions to the problem. He expressed that the dependencies are unfortunate, as the team often cannot finish their committed tasks before the end of the sprint.

[7] The Scrum board is typically divided into three columns: 'to do', 'doing', and 'done'.

SMB lets the team members handle the relations with the suppliers themselves for most of the time. But when the waiting time really becomes too long, SMB can always help and intervene by talking once more with the external party to get issues solved quicker. TMB2 recognizes that team members are often capable of handling these contacts. In accordance, POB explained that it is the task of SMB and himself to make the team aware of the fact that team members can establish interfaces with suppliers themselves. In Doc3A slide 19, this is indicated to be the right way to handle impediments: to support the team in solving them.

RTE recognizes the issues surrounding the dependencies with external suppliers that work according to the Waterfall method. She advocates for better education on the compatibility between this situation and working with Scrum. However, this topic was excluded from the workshops for Scrum Masters, as Doc3A slide 8 shows.

Furthermore, as their customer, the Operation is an important stakeholder of the teams. However, both teams are experiencing difficulties in the communication with, and effort coming from the Operation. SMA explained:

"Company X is very operation-driven. When a team needs the Business, the Business keeps saying: 'no, I am too busy, the Business has priority'. You have to do something about that as Company X. Because this cannot be intended this way. […] When I ask a team member why a certain meeting with the Business still has not taken place and it really takes too long, I will interfere. I then go to 'the boss' of our contact and ask: 'Wasn't that person supposed to be available to help my team? Why is it not working, should we choose someone else then?" –SMA

POB recognizes the fact that work form the Operation has a higher priority than collaboration with IT. Often the team cannot use the people from the Operation that are assigned to working with IT. In order to be able to plan meetings with the Operation, SMB shared that the team resorted to an Excel sheet to plan their meetings ahead.

Overall, the commitment from the Operation seems to be lacking. PO1 and TMA1 both indicate that the Operation was poorly represented at the recent inspect & adapt session (demo). TMA1 would have expected otherwise, because there the teams show exactly what they delivered for the Business in the period prior to the demo. TMA1 further described that during a product increment of ten weeks (five sprints) the Operation is not much involved either. During these ten weeks, TMA1 does not know if the Operation is pleased with their progress, or if they are not asking enough questions about the team's delivered work. He thinks that SMA or POA could probably play a role in facilitating that contact, although he would expect that curiosity from the Operation comes naturally.

POA acknowledges the agile framework of Company X is an 'IT party':

"The Business did not ask us to work in an agile way. We adjusted our way of working and asked the Business: please join us. We informed them late on the fact we were going to work with a Product Owner. In that respect we did not work agile at all. We did not ask our customer how we could develop in the best possible way together." –POA

SMB has the same vision. According to SMB, a transition like this has to be done in consultation and collaboration with the Operation. He sees ING as a good example, where delivery and business work together in one team with a Product Owner and no Scrum Master. SMB believes the Operation should be involved in everything, like defining and developing user stories. If that was the case, they could indicate their needs and wishes earlier in the process. Handling these issues with the Operation is not easy for the teams. Especially because the Business has a lack of long-term vision, as stated by POA and RTE. If they had one, this would help a lot with putting together the backlog, POA explained. Now, the teams are mostly occupied with eliminating technical debt (support tasks), and the Operation is not really benefitted by that concerning innovations. According to POA, the Operation is either taking a wait-and-see stance, or buying and contracting products without consulting IT.

Challenging of and interfering with dysfunctional organizational practices

POA and TMA2 both observed two dysfunctional organizational practices. Firstly, POA mentioned that some colleagues within the agile framework are still holding on to the old way of working. They are distributing additional work to teams or specific team members, which is not included on the backlog. This is confusing for the team and discards the backlog and the agile method. POA therefore believes that the roles of Program Manager and RTE have to be fulfilled as purely as possible to give the right example to the teams. TMA2 recognizes that decisions influencing the team's work are regularly made on a higher level of the organization. Then, user stories or features with an unexpected high priority suddenly have to be handled by the team with a tight deadline.

Second, TMA2 described that because of decisions from higher up, people from several teams are sometimes put together in order to do a specific task. This happens during a sprint and without any consultation with the teams. This is disadvantageous for the team because it relies on a certain number of resources that is disturbed by rearranging the team's composition. In both situations POA tries to protect his team, but that is not always easy. The only thing POA can do is to talk to the person making the decision. POA shared:

"I try to protect the team, for example regarding its composition. IT has the tendency to say: you have such a big team, hand in one member. I try to protect them from that, but also from people who do not work according the agile way of working. And when any of that does happen, I try to support the team members or question them, take on a coaching role. […] A while ago a resource was taken from my team. The RTE made that decision without consulting me. Not only was that inconvenient, but what really bugged me was the fact that before making that decision, it was never considered in which scenario the most value would be created." –POA

During the interview with TMB3, this topic was not discussed.

Analysis

Managing stakeholders

For the teams, managing stakeholders mainly means establishing interfaces with either external suppliers or the Operation in order to remove impediments. In Team A, SMA will interfere when the team's assigned contacts from the Operation are not available for consultation. In Team B, SMB and POB support the team members in establishing contact with external suppliers themselves. When this is not fruitful, SMB will interfere. The latter is in line with the content of the workshops for Scrum Masters and Release Train Engineers (see Doc3A, slide 19)

The strong dependence on external suppliers seems inherent to the nature of the team's tasks. According to RTE, it is essential for teams to gain more education on how to execute sprints in combination with external dependencies and long waiting times. Therefore it is remarkable this topic is deliberately excluded from the workshops, as Doc3A slide 8 displays.

From statements of POA, TMA1, and SMB it became clear that the Operation is not aligned with the IT Department. This raises issues, for example concerning the creation of user stories (innovation projects), while the Operation has no long-term vision (POA, RTE). Moreover, from statements of SMA, TMA1, SMB and POB it appears that the Operation is not accustomed to customer collaboration. Individual Scrum Masters or Product Owners are not able to resolve this non-alignment. As SMA stated, Company X should intervene. Because now, the IT department and the Operation are not working together as meant in an agile context.

Challenging of and interfering with dysfunctional organizational practices

Within Team A, POA and TMA2 noticed two dysfunctional practices from the organization that interfere with the team's progress and pace. These confuse and disturb Team B, because they discard the planned work on the backlog, and the number of resources POA reasons from when he constructs the content of the backlog. It is often hard for POA to interfere with these

practices, as the decisions are made by others higher in hierarchy. But he does address and discuss his concerns and frustration with the decision-maker.

4.3.8 Developing the team

Results

Doc3A, Doc3B, Doc3C, and Doc3D show that during the workshops for Scrum Masters and RTE's several topics related to team development were addressed: the team development stages and the necessary conditions to grow from the forming to the storming phase (Tuckman, 1977); constructive ways to give and receive feedback; the five dysfunctions of a team (Lencioni, 2002); and ideas to effectively carry out the retrospective.

SMA explained that the team is still in the first phase of Tuckman's team development model, which means the team is still in its beginner phase. According to her, this is reflected in the fact that team members are very polite to each other and still lean on SMA and POA. SMA further shared that, together with POA, she invests a lot in the development of the team and interpersonal relationships. Once every couple of weeks the team dedicates a morning or afternoon to diverse topics of team development. When the team just got together, these meetings covered for example the characteristics of the customer, and the personalities of the members on the team. The next meeting will be about what the team expects from SMA and POA in terms of their roles. TMA1 and TMA2 both affirm team sessions are organized regularly. TMA2 emphasized it was nice to find out everyone on the team appreciates the same values in interacting and working with each other.

Team B, also in the forming stage, does not spend time on interpersonal relations and team development outside of the retrospective, according to TMB2. SMB admitted he is letting these topics slip for now, because SMB and POB are busy with plans for the restructuring of the team (see paragraph 4.1). TMB1 recognizes little attention is devoted to interpersonal relations within the team, but he believes that is fine. As he sees it, every team members knows how to behave professional towards each other. According to TMB1, this is common sense and does not need to be steered in any way. TMB3 understands it is difficult to devote attention to interpersonal relations in Team B because of its design:

"It is hard to form a unity in this team, because it isn't a team. We have basketball players, football players, and supporters all on the same field. So there is little attention for developing the team, but then again: you can't develop a team if you don't have a team in the first place." –TMB3

During the interview with RTE, this topic was not discussed.

Analysis

In Team A, SMA and POA organized multiple team sessions to address different topics related to team development, among which the creation of shared mental models about team identity, work, and the customer. TMA1 and TMA2 were both positive towards the team sessions, especially regarding the creation of shared team norms and values (Tabaka, 2006).

Within Team B, little attention is devoted to team development and interpersonal relations. SMB and POB do not organize any team sessions in contrast to Team A. SMB let team development and setting team goals go for now in light of the restructuring of the team in the near future. It seems SMB believes working on team development has no use at the time of the interview. TMB3 understands this, as he explained there is not a real team to develop. This is illustrated by the statement of TMB1. He believes all team members know how to behave professional, so there is no need for enhancing interpersonal relations. TMB1 does not see the benefits of devoting time on team development, probably because there are only rare moment on which the team works together.

The creation of shared mental models is one of the necessary conditions for a team to develop from the forming into Tuckman's storming stage following Doc3A slide 21 and 27. However, it did not become clear from the analyzed documents if the IT teams can be qualified as the type of teams represented in the studies of Tuckman (1977) and Lencioni (2002). For Team B, it seems that devoting time to team development is not relevant because of its design.

4.2.9 Motivating the team

Results

According to SMA, Team A is known for being convivial. This is because of the mutual click among the team members, and the fact that a lot of attention is paid to team building. Furthermore, SMA believes to be on the same level as the team and not above them. She shows this for example by doing something unexpected or crazy to ensure team members do not feel onerous if they say something crazy or make a joke themselves. POA believes extending leadership also means motivating the team, laughing, and having an identity as a team. Having fun is really important to him. This is confirmed by TMA1 and TMA2 as they both share to be motivated by the atmosphere in the team. TMA1 emphasized everyone's enthusiasm, and TMA2 explained she is mostly motivated by the team culture and the work itself.

SMB admitted he finds it hard to get people on the team in motion. He tries to discover what motivates the team members by actively asking them about their ambitions. Subsequently, he tries to help team members to act on these ambitions. However, he notices team members often do not get round to pursuing their ambitions due to a lack of time. POB notices that paying

attention to the team members' understanding of *why* they do the work they do really helps with motivating them. Participating in demo's once every two weeks in the presence of representatives of the Operation is an example of how this can be achieved. However, POB notices this alone is not sufficient, and does not lead to a self-organizing team. TMB1 is motivated by the dynamics of working with Scrum, which he finds energizing. Moreover, he thinks the ambiance within the whole organization has changed for the better. The topic of motivation was not addressed during the interviews of TMB2 and TMB3 because of the course of these interviews.

Regarding the whole train, RTE notices that sprint and team happiness decrease when teams are not able to complete the tasks they committed to due to external dependencies. In this regard, TMA1 shared that not being able to finish a story can be slightly disappointing, however this does not cause the team to feel down.

Analysis

Within Team A, SMA and POA try to motivate the team mainly by ensuring a good atmosphere wherein the team members can be themselves, and where there is room for conviviality and laughter. This is recognized and appreciated by both TMA1 and TMA2.

Within Team B, SMB tries find out what intrinsically motivates the team members by asking about their ambitions (Appelo, 2011). However, he notices some team members do not act on their stated ambitions. POB notices that showing the 'why' behind the work and the backlog helps to get the team more invested in their work. TMB1 is motivated by the dynamics of working with sprints, and the improved ambiance throughout the organization. This does not match the statements of SMB and POB, but because TMB2 and TMB3 did not elaborate on this topic, the researcher is not able to draw any conclusions from this.

4.4 Summary of the results

In Table 4.1, a summary of paragraph 4.1 – 4.3 is presented. The most important findings are shown per item, and separately for each team. Subsequently, to provide a complete image the similarities and differences between the teams per item are clearly stated in Table 4.2. Table references that are used have the following form: *Table #, ColumnRow.*

Table 4.1		A	B
		Team A	**Team B**
I	**Task and group design**	Team members work on specialized tasks. Team members work on both innovation and support tasks. Team members are dependent on third parties during sprints.	Team members work on specialized tasks. Team members work on both innovation and support tasks. Team members are dependent on third parties during sprints.

		Team members have the following roles: Application Consultant, Information Analyst, or Infrastructure Designer. Thus, 7 members with a total of 3 roles (see Annex B).	Team members have the following roles: Application Consultant, Information Analyst, Tester, Designer, or Business Developer. Thus, 9 members with a total of 5 roles (see Annex B).
II	**Role fulfillment**	Both SM and PO roles can be fulfilled as every individual pleases. SMA believes her role includes specific tasks that are related to a SM role within Company X. The role of SMA is positively perceived by TMA1 and TMA2.	Both SM and PO roles can be fulfilled as every individual pleases. SMB believes his role is not elaborated enough. There are varying responses to the role of SMB. TMB3 has a positive stance, TMB1 neutral, and TMB2 believes the role of SMB is viewed as too extensive.
1	**Coaching in self-organization**	SMA mostly guides and coaches the team in self-organization. She lets the team figure out how to work, but still asks for a status when necessary. The team members feel they can make their own choices as it comes to what and how to work.	SMB and POB Owner find it hard to find the balance between directive leadership and team responsibility. SMB is disappointed in the amount of self-organizing behavior the team displays. Both SMB and POB do not always have faith in the team accomplishing their work well. TMB2 recognizes this, as SMB asks about work details. TMB1 feels he can make his own choices as it comes to his work.
2	**Coaching in agile/Scrum**	SMA has experience with Scrum and teaches the team the 'why' behind the practices. This is affirmed by the team members. There is also room for TMA1 take a leadership role upon himself regarding this topic. However, the knowledge level of the team does not seem up to par.	Neither the SMB or POB have any prior experiences with agile or Scrum, thus coaching on this topic is a quest for them. The knowledge of the team members varies, and so do their opinions on how to effectively use agile practices. This raises discussions within the team about the most effective approach to work.
3	**Facilitating meetings**	By ignoring looks of the team members, SMA influences them to own the daily stand-up. The stand-up is performed by asking the three questions prescribed by Scrum theory. The retrospective is used to evaluate and agree upon improvements. The follow-up of these agreements could be done better according to SMA.	Instead of every team member answering the three stand-up questions, the whole backlog is discussed from top to bottom during the stand-up. Answering the three questions is not relevant for the team. However, this other approach still raises issues with the team members. The retrospective is used to evaluate and agree upon improvements. SMB makes use of creative ideas and metaphors to spark conversation on points of improvement. This is not appreciated by TMB2, who believes this is too woolly.
4	**Guiding and setting direction**	SMA provides room for the team to try out new approaches and tools improve their effectiveness. POA helps the team to focus by coaching when the team performs too many support tasks rather than innovation tasks.	Both SMB and POB come up with new ideas to enhance team effectiveness. SMB keeps the team focused by asking questions and pointing out the priorities on the backlog during the stand-up.
5	**Facilitating decision-making**	Whole-team decision-making in Team A takes place in consultation, but often hesitantly. Both SMA and TMA2 recognize that giving an opinion in front of the rest of the team is not always easy for some team members. Therefore this is addressed during a team session. When, after enough time and space are provided a decision is still not made by the team, SMA or POA make the call to prevent slowing down the process.	Regarding whole-team decision-making, shared leadership is displayed mostly by one particular team member that initiates decision-making and tries to mobilize the team. SMB and POB always strive for consensus during the decision-making process. However, often a couple of people on the team do not seem to care, and therefore the decision-making process

			muddles along. When this happens, ultimately POB will settle the matter.
6	**Facilitating teamwork & encouraging knowledge sharing**	In spite of the fact that team members from Team A have specialized tasks, SMA and POA do their best to show them the ways they can support each other: by learning from each other, and subsequently supporting and challenging each other. Also, the team members seem eager to learn about each other's work and seem to want to expand their knowledge on different topics. They initiate knowledge sharing sessions themselves. Shared leadership can therefore emerge on specific topics.	The mix of roles within Team B is even greater than the variety of roles in Team A. Therefore, knowledge sharing is often not possible, because the knowledge is too specific, or is not applicable at all in another role. SMB does encourage teamwork, however, this is often discarded by the team members. POB does see some bottom-up initiatives regarding teamwork and knowledge sharing, so he does not encourage that in particular.
7	**Managing the context**	It is hard for SMA and POA to remove impediments caused by external dependencies, as they are inherent to the team's tasks. SMA therefore brings agility to the table as a condition during new contract negotiations. SMA and POA do not have the means to align the IT department with the Operation. POA tries to shield the team from dysfunctional organizational practices by starting a conversation with the ones that cause these practices with their decisions.	It is hard for SMB and POB to remove impediments caused by external dependencies, as they are inherent to the team's tasks. SMB and POB encourage and support team members in addressing these impediments themselves. This is in line with the workshops for SM's and RTE's (see Doc3A, slide 19). SMB and POB do not have the means to align the IT department with the Operation.
8	**Developing the team**	SMA and POA pay attention to the development of the team by organizing team sessions. During these team sessions, the team members for example talk about what they value in teamwork and each other's personalities. Both TMA1 and TMA2 appreciated jointly shared values were drawn up during one of these sessions.	SMB decided to not pay further attention to team development and interpersonal relations until the team is restructured. According to TMB3 this is logical, as there is no real team that works closely together to develop. This is illustrated by TMB1, as he stated there is no need for the enhancement of interpersonal relations, because everyone knows how to act professional. It is not unlikely that Tuckman's model (1977) is not applicable to this team (see Doc3A, slide 21-27).
9	**Motivating the team**	SMA and POA motivate their team mainly by ensuring a good ambiance and room for fun. This is recognized and mentioned to be motivating by both team members.	SMB asks for individual ambitions. POB notices the team members are motivated by knowing why they do what they do. TMB1 is motivated by the dynamics of working with Scrum and the improved ambiance within the organization.

Table 4.1: Summary of the results

Table 4.2		C	D
		Similarities	**Differences**
I	**Task and group design**	In both teams, the team members have their own specialized tasks, and they work on both innovation and support tasks. Both teams have a substantial amount of dependencies with external suppliers.	Team A consists of 7 members with 3 different roles. Team B consists of 9 members with 5 different roles.
II	**Role fulfillment**	The overall roles of SM and PO can be fulfilled the way every individual pleases.	The way the role of SM is perceived by the team members from either team differs. In Team A, the

		Both SMA and SMB agree on the fact that the role of Scrum Master at Company X is not equal to a 'traditional' Scrum Master role.	role is positively perceived. In Team B, this varies from positive to neutral to a more negative stance.
1	**Coaching in self-organization**	In both teams, individual team members can decide how and when they execute their own tasks. In both teams, the SM and PO ask for statuses when that is necessary.	In Team A, SMA withdraws and lets the team figure out the best ways to get work done. In Team B, SMB and POB find it hard to let loose and let the team self-organize, because the amount of coordinating skills the team members display is insufficient for handling a multi-project portfolio.
2	**Coaching in Agile/Scrum**	In teaching the team about agile and Scrum practices, team members who have experience can help (shared leadership).	In Team A, both SMA and TMA1 have a lot of experience with Scrum and explain the 'why' behind the Scrum practice. In Team B, both SMB and POB do not have any experience, and thus they are still searching for the best ways include agile and Scrum principles in the team's way of working.
3	**Facilitating meetings**	In both teams, the stand-up still takes place when the SM or PO is not present. There are team members that take over a leading role. In both teams, the retrospective is used to evaluate the previous sprint and agree upon improvements for the next sprint.	Team A holds on to the 'three questions' during the stand-up that are normally required in Scrum. Within Team B the whole backlog is discussed during the stand-up, because answering the 'three questions' is not relevant for the team.
4	**Guiding and setting direction**	In both teams the SM and PO try to focus the teams as much as possible by asking questions. In both teams, SM and PO come up with ideas to improve ways of working.	In Team A, ideas to try new approaches or tools come from the team members as well. In Team B this is not the case.
5	**Facilitating decision-making**	In both teams, SM and PO strive for consensus during whole-team decision-making. And in both teams, not every team member participates. In both teams, SM or PO ultimately make the decision when the team does not reach one in order to prevent slowing down the process.	In Team A, introvert personalities seem to be the cause of the fact that not every team member participates during deliberations and decision-making. In Team B, it seems that some team members are indifferent when it comes to whole-team decision-making. This has probably to do with the fact they are not affected by these decisions.
6	**Facilitating teamwork & encouraging knowledge sharing**	In both teams, working together is encouraged by the SM. In both teams, team members display shared leadership on this topic. In Team A, knowledge sharing sessions are organized. In Team B, a few team members take the lead on rare stories that can be handled by the team as a whole.	Within Team A it is possible for the team members to learn from each other and thereby help with and challenge work of their peers. Team members initiate teamwork and knowledge sharing themselves mostly. Within Team B, the variance of specialties of the individual team members is too large to learn about each other's work. Moreover, all team members works on their own tasks and goals every sprint. Therefore it is hard to work together and SMA's encouragement is often in vain.
7	**Managing the context**	For both teams, the SM and PO have additional tasks in dealing with external suppliers that cause long waiting times and with the Operation that is often not available for customer collaboration. It is often difficult to interfere with these situations.	When there is an opportunity, SMA tries to negotiate with external suppliers to include conditions in new contracts that are compatible with working in iterations. Within Team B, SMB and POB encourage team

			members to handle issues with external suppliers themselves before they interfere.
8	**Developing the team**	The teams do not have team goals, and in both teams there are little to no conflicts (see Annex C).	In Team A it is fruitful to devote time to team development through team sessions. In Team B, it is not fruitful to do this, because there is no need for team development as every team member individually works on his own tasks. An enhancement of interpersonal relations therefore seems not necessary.
9	**Motivating the team**	In both teams, SM and PO consciously think about how to motivate the team members. TMA1, TMA2 and TMB1 are motivated by a good atmosphere.	The teams are motivated SM and PO in different ways. In Team A, this is focused on whole-team fun and ambiance. In Team B this is focused on individual ambitions (SMB) and creating understanding on *why* the team does the work that they do (POB).

Table 4.2: Similarities and differences between Team A and Team B

4.5 Cross-item analysis

In Table 4.3, a cross-item analysis of the results is presented. Because a large amount of items is influenced by the teams' design and their variety of tasks, the researcher decided to cross-analyze the items separately for each team. This choice is made because the composition of each team differs in terms of the variation of roles. Therefore this component has a different effect on the nine items with regard to either Team A or Team B. For every item it is explained by which other item(s) it is influenced and why and/or how. (This is the other way around for the items with a '*', because it logically flows from the content of the table.)

Table 4.3		E	F
		Team A	**Team B**
I	**Task and group design***	**Item I** has the biggest effect on **item II, 4, 6** and **7** (see Table 4.1, A4, A6, and A7).	**Item I** has the biggest effect on **item II, 1, 3, 4, 5, 6, 7,** and **8** (see Table 4.1, B1, B3, B4, B6, B7, and B8).
II	**Role fulfillment**	The tasks of SMA are influenced by **item I** (see Table 4.1, AII).	The tasks of SMB are influenced by **item I** (see Table 4.1, BII).
1	**Coaching in self-organization**		A growing interest of SMB with the content of the work, is probably reinforced because there is no need for **item 8** within Team B (see Table 4.1, B8), and **item 6** is done in vain (see Table 4.1, B6). The little self-organizing behavior the team displays, is caused by **item I**, because all team members can focus on their own work and get it done without coordination (see Table 4.1, BI).
2	**Coaching in Agile/Scrum**		
3	**Facilitating meetings**	The relevance of answering the three questions during the stand-up is reinforced by, and reinforces **item 6,** because SMA and POA showed the team how to challenge and support each other, even when team members do not have extensive	The fact that the three questions during the stand-up are not relevant, is caused by **item I**: the application-focused tasks every individual team members of Team B performs (see Table 4.1, BI).

		knowledge of every topic (see Table 4.1, A6).	
4	**Guiding and setting direction**	**Item I** reinforces the need to enhance the focus on the user stories, instead of ad hoc support tasks (see Table 4.1, A4)	**Item I** reinforces the need to enhance the focus on the prioritized items at the top of the backlog (see Table 4.1, B4).
5	**Facilitating decision-making**		Because of **item I,** not every member is invested in whole-team decision-making, because it does not affect everyone's work (see Table 4.1, B5).
6	**Facilitating teamwork & encouraging knowledge sharing**	**Item I** influences the way leadership behavior of **item 6** is carried out (see Table 4.1, A6).	Team B consists of an even larger variety of Team A roles than (see Table 4.1, AI+BI). Therefore **item I** has a negative effect on the need for **item 6** (see Table 4.1, B6).
7	**Managing the context**	**Item I** influences the type of impediments have to be dealt with in **item 7** (see Table 4.1, A7).	**Item I** influences the type of impediments have to be dealt with in **item 7** (see Table 4.1, B7).
8	**Developing the team**	In spite of **item I, item 6** is the reason to devote time to team development and interpersonal relations (see Table 4.1, A6, A8).	The influence of **item I** on **item 6**, in turn leads to the fact that team development is not fruitful for this team (see Table 4.1, B8).
9	**Motivating the team***	It seems **item 9** reinforces the positive perceiving of **item 1-8** (see Table 4.1, A9).	

Table 4.3: Cross-item analysis

5. Conclusion & Discussion

In this final chapter, the conclusion and discussion of this research are presented. Following the conclusion, the theoretical contribution of this thesis is provided in the second paragraph, followed by the practical recommendations for Company X in paragraph 5.3. Furthermore, the limitations of the research and suggestions for further research are discussed in the fourth and fifth paragraph. And finally, in paragraph 5.6, the researcher critically reflects on the research process.

5.1 Conclusion

In this paragraph, the following research question will be answered:

To what extent does current operational leadership behavior in the teams of Company X's IT department, studied from a group dynamics perspective, match the demands for leadership in an agile way of working, and to what extent is the team and task design of the IT teams compatible with an agile way of working?

After analyzing the results, it is not possible to view and answer the two parts of this question separately, as agile leadership behavior needs agile team and task design at its base. An agile process is characterized by incrementally delivering results by a whole-team effort. To gain the most benefits from an agile method, the design of the team and its tasks should fit the agile way of working. This means a team ideally consists of people that need each other in order to achieve results, and possess the regulation capacity to work on their innovation project without disturbances. During the interviews, it became clear that both teams and their tasks did not meet the ideal structural conditions for an agile team. Because of their multiple-item portfolio, individuals mostly work parallel on independent tasks. Furthermore, the teams work on both user stories (innovations) and incidents (support tasks) during the same sprint. Finally, inherent to the nature of their tasks, the teams deal with a large number of external dependencies.

The IT teams of Company X work according to the Scrum method: they are guided by a Scrum Master and Product Owner and they work with two-week long sprints. As a consequence, behavior in line with this method is expected from the team members: bearing whole-team responsibility and accountability, and sharing knowledge continuously. However, in light of the facts stated above, it is not self-evident for the teams to fully benefit from working with an agile method, and thus to display the desired behavior.

For this thesis, theory on agile leadership was studied and used as a base for the interview guides. The results show several situations wherein described leadership behavior by the participants does not comply with the prescribed agile leadership behavior presented in paragraph 2.5. However, because team and task design are not fully compatible with an agile way of working, it is difficult to draw conclusions on the extent to which the behavior of the team leaders matches the theory on agile leadership. As paragraph 4.2 shows, the 'standard' tasks that belong to the roles of Scrum Master and Product Owner are not equal to the tasks Scrum Masters and Product Owners within the Operations train in reality have to fulfill.

When comparing Team A and Team B it is notable that the day-to-day processes within Team A run smoother than in Team B. When it comes to leadership behavior, the guidance from the Scrum Master and Product Owner of Team A seems to help the team regarding their development in different areas: self-organization, maintaining focus, teamwork and interpersonal relations. They have found a way to make Scrum work by balancing coaching and withdrawing, by teaching, inspiring and motivating, and by showing how to emphasize interactions through challenging and supporting each other (see Table 4.1).

In Team B there are a lot more difficulties present in the daily processes of the team. In comparison to Team A, the mix of team members and the nature of accompanying tasks in Team B (see Annex B), make it hard for them to function as an agile team. This is shown in the results summarized in Table 4.1 and Table 4.2. However, the Scrum Master and Product Owner try to be agile leaders to their team. This is reflected in their efforts to get the team to self-organize and work together, and in the way they hold on to Scrum practices like the daily stand-up while this does not benefit the team. When these efforts turned out to not have the desired effect, this caused frustration towards and distrust of the team. Therefore it is commendable that the Scrum Master and Product Owner recognized that something had to change, and have decided to restructure the team.

Thus, as a final conclusion for (agile) leaders it is most important to always adjust one's leadership style and practices to the specifics of an individual team and its context. Holding on to agile leadership practices when the design conditions and context are not optimal for working with an agile method, will not make team members display behavior that is desired in an agile context.

5.2 Theoretical contribution

Working in an agile way is most effective and appropriate under conditions that are common in software innovation projects: the problem is complex, solutions are initially unclear, and the

product requirements will most likely change during the process. Furthermore, it is possible to modularize the work and collaborate closely with the customer. Finally, cross-functional collaboration is vital and creative breakthroughs are of great importance (Rigby et al., 2016).

The studied teams in this research alternate the work on tasks of innovative nature and support tasks, and most of the time cross-functional collaboration is not necessary in order to achieve results. Following theory, these are not optimal conditions for the use of an agile method. In spite of this, Team A does benefit from working with Scrum. Team members are kept sharp by learning from one another and challenging each other's work methods and approaches daily. Moreover, the Scrum Master and Product Owner increasingly keep the team focused on the prioritized backlog. For Team B, a team with a more diverse set of roles and accompanying tasks, these benefits seem harder to acquire because of team and task design conditions.

Therefore, this thesis contributes theoretically in the sense that an organization should be careful with implementing an agile method when the conditions of its context are not optimal for that purpose. However, when the conditions are different from those of software development, this does not mean an agile method like Scrum cannot benefit a team at all. This depends on the specifics of the team and its tasks, and seems to additionally depend on the guidance of that team.

5.3 Recommendations

Recommendations for Scrum Masters and Product Owners

The first recommendation is directed at Scrum Masters and Product Owners within the Operations train. The results show that the design of the Scrum teams in the Operations train does not fit an agile way of working very well (see paragraph 4.1). Therefore, agile leadership described in paragraph 2.5 should not unquestionably be applied to any team from this train, but should be consciously considered. The differences between the results on Team A and Team B illustrate the varying situations wherein these leadership practices directed at for example self-organization, Scrum meetings and teamwork are and are not effective (see Table 4.2, D1, D3, and D6).

Scrum Masters and Product Owners should therefore investigate if the purposes of Scrum and agile practices are achieved. If this is not the case, the practices should be reconsidered (see paragraph 4.3.3). When team members have varying opinions on the effectiveness of Scrum practices, this is a good moment to start a whole-team conversation. What do these practices mean for the team? How can they be altered in order to gain the most out of it?

Furthermore, agile leaders should, in association with the team members, find out what they can reciprocally do for each other in order to achieve a more effective way of working. Find out how team members can challenge and support each other content-wise and process-wise to spark a willingness to continuously enhance their way of working (see paragraph 4.3.6).

Recommendations for Company X

There should be more guidance for Scrum Masters and Product Owners on how to carry out their tasks. This guidance however should be adjusted to the role of Scrum Masters and Product Owners within the agile framework. This means taking into account the specific team and task design of the Scrum teams, which has a substantial influence on the effectiveness of agile (leadership) practices (see Table 4.3, IEF and the items referred to). Now, every agile leader within the Operations train can carry out their tasks as they please (paragraph 4.2). For an inexperienced Scrum Master or Product Owner this may entail implementing agile and Scrum practices by the book. However, as the results indicate, these practices do not fit the Scrum teams of Company X in all cases (see Table 4.1, B1, B3, B6 and B8). Scrum Masters and Product Owners need to know how to deal with external dependencies (paragraph 4.3.7), how to carry out effective Scrum meetings when tasks miss interdependency (paragraph 4.3.3; Table 4.3, F3), and how to coach a team in self-organization with a multi-item portfolio (paragraph 4.3.1; Table 4.3, F1). Thus, the guidance of agile leaders must be specifically altered to match the context of the Operations train.

With regard to team development, models from Tuckman (1977) and Lencioni (2002) are used to teach Scrum Masters and RTE's how to develop the teams (Doc3A-Doc3D). However, it is unknown if the IT teams can be equalized with the teams from these researches. This must first be investigated before these models are used for team development of the IT teams (paragraph 4.3.8).

Furthermore, there are some dysfunctional organizational practices that disturb the Scrum teams during their sprints. These are practices agile leaders cannot interfere with, thus Company X should do something about them (see paragraph 4.3.7). First, everyone working within the agile framework should respect the rhythm of Scrum, and thus should not hand out extra work, discarding the backlog and the Product Owner. This is confusing for the teams and it slows them down. New tasks can be put on the backlog for the next sprint. Second, the Operation is not aligned with the IT department. The Operation should give higher priority to collaboration with the teams, so that the teams can maintain their velocity. Third, it would be a great enhancement if the contracts with external suppliers could be altered to match the pace of the sprints.

Recommendations for follow-up research

Finally it is recommended to consider follow-up research within the organization on two topics: 1) the task and work division among and within the teams, and 2) the way performance management is established for the employees in the agile teams.

Division of labor

The results in paragraph 4.1 and paragraph 4.3.4 show that teams work both on user stories (innovation tasks) and incidents (support tasks). Ideally however, an agile team is a small group of people who work together on an innovation project with mutual dependent tasks (see paragraph 2.1.3). Therefore it is advised to use an employability matrix to map *all tasks*, both *support* and *innovation* tasks, on a team level for both trains. This will provide insight in the extent to which the tasks of a certain type are scattered among the teams. This is important to know, because support and innovation tasks each require different team dynamics. Support tasks need to be solved ad hoc, while innovation tasks can for example be carried out in sprints.

When all tasks are mapped, the question is: why are both innovation and support tasks assigned to the teams, when they are supposed to be agile, thus working on innovation tasks only? Labor should therefore be divided in another way. An option could be to divide the IT department into an IT Support organization and an IT Development organization. To avoid monotonous work, a person could first be part of a team that develops and implements a new application (innovation project), and when that is completed be subsequently responsible for the maintenance and malfunctions of that application until a certain degree of reliability is achieved (support tasks). After that, this person can be included in a team working on a new innovation.

Performance indicators

Although the behavior of people may be influenced by the way their performance is reviewed, the topic of performance management and performance indicators was not mentioned in this thesis. This choice was made by the researcher because of the fact performance management was not part of the studied literature on agile leadership from which the theoretical framework was constructed. Subsequently, the use of performance indicators by agile leaders was not systematically addressed during the interviews. However, it was discussed during two introductory conversations and two interviews. These remarks, displayed in Annex C, show that tension exists between the coaching role of the Scrum Master and the idea that the Scrum Master can provide a valuable contribution concerning the performance review of individual team members. Right now, performance reviews for all internal employees in the IT teams are

performed by someone within the agile framework who is not in direct contact with the team members on a frequent basis.[8]

A person's behavior can be influenced by the way he is reviewed and by what is expected from him. Therefore it should be examined if performance reviews are based on parameters that reinforce agile behavior. If value creation, knowledge sharing and teamwork are key behaviors that are desired from team members, Company X has to make sure these are reflected in the performance management system. Moreover, the opinions on the content of performance reviews appear to be divided. Therefore it is recommended to investigate if contributions from the Scrum Master, Product Owner and fellow team members in the performance management cycle are desired with regard to the context the teams work in.

5.4 Limitations

A couple limitations of the research can be pointed out. First, the selection of respondents was not a correct representation of the teams. A better representation would have been achieved when for Team A an Application Consultant was interviewed instead of an Information Consultant. For Team B, this would have been achieved when a senior instead of a junior team member was interviewed. The selection of the participants occurred on a voluntary basis, and because the interviews took place during the summer, not all team members were available. For these reasons, the researcher had little influence on the selection of participants.

Considering triangulation, participant observations would have been a welcome addition to the document analysis and the conducted interviews. When leaders explain how they execute certain behavior, does not mean they actually display that behavior in practice. While it can be hard to observe specific behavior, because a substantial part of behavior occurs implicitly, the researcher believes the data collected from observations could be well used to invigorate or weaken participants' statements provided during the interviews.

Moreover, conducting the interviews involved difficulties because there are several factors besides leadership that influence the agility of the Scrum teams in the IT department of Company X. This often sparked conversation outside of the scope of the research. During most interviews, the researcher succeeded to steer the conversation back to the topic of team leadership. In one case however, the researcher was barely able to do so. For this reason there were little statements from TMB3 that could be used in the diagnosis of the actual leadership behavior. On the one hand this was the consequence of the interviewee's extensive knowledge of organizational structure, and his belief that structure is the reason for certain issues like the lack

[8] Employees that are hired from an external company are reviewed at their own organization.

of teamwork and information sharing within his team. On the other hand this was the consequence of him not wanting to speak out regarding specific people and their leadership behavior because of the sensitivity of the topic. While this is unfortunate, it helped the researcher gain more extensive insights of the situation from a structure point of view, which could be used for the diagnosis of the team's design. This was helpful as well during the further collection of data, the analysis of data, and the construction of practical recommendations for Company X.

The final limitation is also related to the conducting of the interviews. With almost every participant, the order of the questions differed from the prepared order, because the researcher sought the order that flowed naturally from the conversation in real-time. This resulted in topics that were touched upon briefly, but from which the subtopics were not deepened enough in terms of explanation. Sometimes the researcher forgot to revisit the subject, or the researcher was convinced the whole topic was already covered. This in turn resulted in topics without statements from all participants backing up the final results.

5.5 Future research

While conducting the interviews, it became clear that the IT teams in the Operations train of Company X do not execute 'classical' Scrum, because team members do not work closely together on one innovation project at a time. Therefore, teamwork and knowledge sharing were at a low ebb. However, there were notable differences in the benefits both examined teams seemed to gain from working with Scrum. For future research, it would therefore be interesting to find out whether Scrum (or another agile method) could be stretched and applied in different situations wherein a team portfolio consists of multiple products. Another idea for future research would be to examine whether or not failed implementations of agile methods were caused by an unfit task or group design.

5.6 Critical reflection

Finally, there are a few topics the researcher would like to reflect on, because it cannot be denied that the choices made by the researcher during the research process shaped the research into this final product.

Terminology: 'operational leadership'

Agile methods originated in the world of software development. This does not mean these methods are not applicable to other branches or work fields, but as stated in paragraph 2.1.3, agile revolves around innovation. The focus of this research is titled 'operational leadership', and is also referred to as 'day-to-day leadership' throughout this thesis. Operational team leadership

refers to leading a team that performs operational tasks. However, operational tasks can be divided into operational innovation tasks and production structure support tasks. Innovation tasks and support tasks differ from each other because of variations in for example dynamics and predictability. Consequently, it is plausible that leadership style and behaviors have to be adapted according to the type of operational tasks a team performs. With the composition of the theoretical framework the researcher did not take this fact into account, because it was assumed that the agile teams only executed innovative tasks. During the interviews it became clear however, that the teams from the Operations train have to disorderly carry out operational innovative tasks and operational support tasks. Thus, while the researcher reasoned from a sheer agile way of working, in practice this was proven not to be the case. If the researcher had taken this distinction into account from the beginning, this may have led to a different theoretical framework, resulting in different interview guides and different results.

Sensitiveness of the topic

Behavior is a sensitive topic, especially when questions are asked about the behavior of one's leader. Conducting interviews on the behavior of others is not a problem when a leader is suited for the job and does it well. When interviewees however had a more negative opinion, the researcher was either asked to refrain from citing the statement, or the interviewee decided to not make a statement at all. This was difficult for the researcher to deal with on the spot, because there was no additional time to think of a plan B. The researcher could have done a better job in imagining this scenario and possible solutions upfront.

Because of this issue, a quantitative research approach for evaluating specific leadership behavior is probably better suited. Then participants can express their opinions anonymously. Also, because a large number of people participate in a quantitative research, the researcher is not at risk of singling out a certain leader or team member regarding their individual behavior and opinions.

Conducting the interviews

Conducting the interviews was found harder by the researcher than anticipated beforehand. It was especially difficult to deal with the differences in the extensiveness and content of the answers provided by the participants. Some participants gave very short statements that had to be pulled out of them. Other participants told long stories while deviating from the topic of the question asked. As an interviewer, one has to be able to react to these situations instantly, but this is not always easy. For the researcher, it was for example hard to interrupt narratives of the participants. But above all, it was difficult to refrain from talking too soon, or asking another question too quickly when a silence occurred. The researcher became self-conscious of this fact

while listening to the recorded interviews. At that moment it became clear that a researcher who conducts qualitative research has a substantial influence on the collected data. From these experiences, the researcher has learned a lot. These lessons will be taken into account with regard to possible future interviews.

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